#### THE

# SURGICAL INSTRUMENTS OF THE HINDUS

WITH

386

A Comparative Study of the Surgical Instruments of the Greek, Roman, Arab and the Modern Enuropean Surgeons.

BY

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In recognition of his love of Science, his pre-eminent services to the cause of University Education, his administrative ability, and his generous liberality to scholars

AS WELL AS

In grateful remembrance of many acts of kindness,

THIS VOLUME IS

DEDICATED

BY

THE AUTHOR

## PREFACE.

For researches into the state of medicine among the Ancient Hindus, we have several sources of information to scrutinise. The remarks of Dr. Payne regarding the sources of information of Anglo-Saxon Medicine may apply here with still greater force.

First is the evidence of contemporary literature about the craft of physicians and surgeons, since we are sure that there has always been a class of medicine men of one kind or another. Thus we find in the Rgveda, the use of artificial limb as a substitute for a limb accidentaly lost<sup>2</sup>. From the Mahābhārata,

विरिनं हि विरिवाच्छेिद पर्णम् भाजा खेलस्य परितक्तायाम्। सद्यी जंङ्ग्यामायसी विश्वपलायै घने हिते सर्त्तवे प्रत्यथत्तम्॥

Rgveda—15th Rk., 1st Mandela, 116 Sükta.

श्रगस्य प्रोहितः खेली नाम राजा तस्य सम्वन्धिनी विश्रपलानामस्त्री, संग्रामे श्रनुमिः छिन्नपदा श्रासीत्। प्रोहितेन श्रगस्थेन स्तृतौ श्रश्निनौ रानौ श्रागय श्रायोमयं पादं समधत्ताम्। तदेतदाह 'त्राजा'—श्राजौ, संग्रामे, श्रगस्य प्रोहितस्य—खेलस्य राजतः सम्बन्धिन्याः विश्रपलाख्यायां, 'चिरतं'—चर्या, 'विरिन'—नेः पिचिषाः, 'पर्यो' पतत्रम् रूव, 'श्रच्छेदि हि'—पूरा छिन्नमसूत् खलु। हे श्रश्चिनौ । युवा श्रगस्येन स्तृतौ सन्तौ, 'परितक्रमायां'—रात्रौ, श्रागत्य, 'सद्यः'—तदानौमेन, 'सर्त्तवे'—सर्त्तृ गनुम् इत्यधः, विश्रपलाये (श्रायसीं'; जौहमयीम्, 'जङ्गां'—जङ्गीपलिचतं पादम्, 'प्रत्यभत्तम्'— सन्धानम एकीकरणिनत्यर्थः क्षतवन्तौ ।

Sāyana's commentary.

<sup>&</sup>lt;sup>1</sup> Payne's English Medicine in the Anglo-Saxon Times, P. 7.

we learn that when Parikest, the king of the Kurus, became certain of his approximage death by snake bite, due to a curse uttered by a sage, he tried to protect himself by the constant attendance of a namber of physicians, who were well supplied with antidotes. Again it is stated that when the great warrior Bhisma was wounded in war, the skillful army surgeons came to him with the necessary modical and surgical appliances to treat his wounds. From the Mohāvāgga, we learn that Jivaka, the personal physician of Buddha, practised cranial surgery with success. In the Môlavikāgnimitra, we find the use of charms a signot

अंशलाः अलिकियन संतया अल्लात्वरित् प्राणातः कार्यपासाम एकणासः भृतीकतः रक्षाः विवयं ततः क्षिप्रकर्षीयपानि च अक्षाकालाक्षिकरेतं अस्तरे विवर्गत्ति प्रतः

Matiticarata, Alb Pares, Ch. 42.

श्रीतिभव्यो विद्याः क्रमीवृश्यक्तिवृशः अर्मीवृश्यक्तिवृशः कृत्रके आष् क्रिक्ताः ।
लान् द्वाः जान्यवीयुक्तः प्रेणीयक तल्य तवः।
पन वान्यः विद्यान्याः पुत्रविन्यः विवानस्थाः ।
पन सन अर्थवानी वेदोः काद्यक्तियांकां क्रिक्तः
प्रेणीयक्ति प्रक्रमा विद्यान्यांकाः
स्थानस्थि अविद्यानः प्रश्रीवृश्यक्ति ।
स्थान्या प्रथम लक्ष्य पृत्रीः वृद्यविक्रस्तः ।
वैद्याम् विस्कार्यकाल प्रभावन्य व्यवद्यक्ति ।

Makatharata, Bhisema Parsa, Ch. 121, Vs. 5745 - 5750 - (A.S. B. Bat )

<sup>\*</sup> Mohāvāgga, VIII. 1 18

ring as a healing talisman for the cure of snake-bite; and also we find there a reference to a class of physicians who specialised themselves in Toxicology (Visa-Vaidya), and were held in high esteem for their professional skill by the public. From the Bhojaprabandha, the administration of some kind of anæsthetic by inhalation before surgical operations can be ascertained. Similarly from the books of Law, we know the relations of the profession to society in general. In the Manusamhitā, we have unmistakable testimony of the decline of Hindu surgery as the author prohibits the eating of cooked rice from the hands of a surgeon.

Mālavikāgnimitra, Ch. I.

जय। -- जेदु जेदु भरा। घुवसिजी विखवेदी। उदकुमिविधाणेण सप्पमुह्या कप्पिदव्या।

प्रा भक्षेसीभद्ति। धारि। -- एदं सप्पमुह्यम्, अङ्गुलीयसम्। पक्का मह हत्ये गम्।

Ibid, Ch. IV.

परि ।—छिटी दंशस्य दाही वा चतस्यारक्तमीचणम्। एतानि दष्टमाचाणा-मायुष्याः प्रतिपत्तयः॥ (संप्रति विषवैद्यानाम् कर्षाः) राजाः ।—जयसेने । ध्रुवसित्तिः चिप्रमाह्रयताम्॥

Ibid, Ch. IV.

- अवि अधुवसिडिणा चिद्रस्सिटी। मा से अस्ट अधुवसिडिणा चिद्रस्सिटी। मा से असङ्ख्यां पावं॥
  Ibid, Ch. IV.
  - 4 चिकित्सकान्देवलकान्मांसविज्ञयिषालाथा। विपर्णन च जीवली वर्ज्ञाः स्युर्द्धेत्र्यकव्ययीः॥ Manusamhita, Ch. III, 152.

चिकित्सकस्य स्गयीः क्रूरस्यीच्छिष्टभीजिनः। खयात्रं स्तिकानं च पर्याचान्तमनिर्देशम्॥

Ibid, Ch. IV, 212.

महि! देवीए इद सिणिसआसादी आनीदसागमुद्दासणाहं अङ्गुलीययं सिणिइं णिभालयन्ती तृह जवालको पिइदिश्च॥

Secondly, monuments or inscriptions scattered hisset the country have to be searched, as references found therein to the science of medicine, are more trustworthy than documents which may have been more or less tampered with by interpolations of subsequent writers. Thus we learn from the Edicts of Ašoka, that hospitals were established by him in different parts of his kingdom, not only for the treatment of suffering humanity but also for the brute creation.

Thirdly, personages and scenes in connection with medical practice, and figures of herbs may have been represented in works of art which must be thoroughly examined. But unfortunately we do not possess any such work of art and so we can learn nothing to our purpose from this source. In the interpretation of the subject of the Friezes of the Rani Naur and Ganesha's Cave. Dr. R. L. Mitra says, . "The shampsoing in the tianesa Cave may be for a parent, but the close weat with the right hand round the neck of the male personage in the other, would be highly unbecoming in an unmarried female. But if the stooping figure be taken to be that of a wounded man, a wounded priest for instance, the lady may be a maiden nursing him without any offence to propriety. It is true that the appearance of the figure on the mattress does not indicate suffering from a wound, but in the Bani Naur frieze, the stooping head affords some indication of it?"

> पूर्व चिकित्वसम्मातं प्रच्यातनप्रतिश्वित्। विद्या यापूरिकस्थातं स्रक्षातिकारिको स्थल् ।

> > Manumahhita, Ch. IV, 230

<sup>\*</sup> Rook Inscriptions, Edict II.

<sup>\*</sup> The Antiquities of Oriens, Vol. 11, p. 11

in museums are to be examined and the reports of finds of surgical appliances in various localities are to be studied. We know what a flood of light has been thrown on ancient Greek surgery by the steady progress of archæological discovery and finds of instruments at Pompeii, Herculaneum and elsewhere, and by the study of the specimens preserved in the Naples museum, the Athens museum and other museums of Europe. But as far as I have been able to trace, our museums contain no finds supplying us with any information on the subject.

Fifthly, the literature of medicine itself should be thoroughly inquired into and excerpts elucidative of our subject should be compared with one another. "The detailed descriptions of the very numerous Hindu instruments not being very minute or precise, Professor Wilson says, we can only conjecture what they may have been, from a consideration of the purport of their names, and the objects to which they were applied, in connection with the imperfect description given." We are fortunate, however, in possessing a copious medical literature of great merit from very early times. We shall describe the important books in the introductory chapter, with short notices of their authors.

Sixthly, the comparative study of the science at the same period in other countries also furnishes us with valuable materials as regards the state of medicine in a country. It is well known that Sanskrit works are often written in a very terse language

Royle's Antiquity of Hindu Medicine, foot-note, p. 59-60.

and it might be said with greater truth about the works of early Sanskrit authors, the comment of a learned critic about the style of Thucydides, the famous historian,—"the most obvious and characteristic of his peculiarities is an endeavour to express as much matter as possible in as few words as possible, to combine many thoughts into one, and always to leave the reader to supply something of his own. Hence his conciseness often becomes obscure." I could not form any idea as to shape of some of the surgical instruments from the descriptions given in the text books, and the commentators are often silent on those passages. But when I read the accounts of similar instruments in Greek and Roman literature, my difficulties at once cleared up. We know with what brilliant results comparative mythology and comparative philology have been studied of late years, and I am sure that a comparative study of medical science by scholars will lead to interesting discoveries. So I have added descriptions of the instruments according to the Greeks, Romans and Arabs at the end of the descriptions given in Sanskrit books: the former serving as commentaries on the latter.

Seventhly, in the accounts of historians, travellers and pligrims from foreign countries, may be found notices of medical science, as they saw it practised during their sojourn in a country, and such impressions, if properly collated, may bear impartial testimony to the progress of the science at the time. Again, we must enquire if the original treatises of medicine can be proved to have been translated into different languages and whether the remedial agents of a country can be traced in the Pharmacopæias of different nations. Thus we

learn from the accounts of Houen Tsang and Fa Hian that charitable institutions such as hospitals, dispensaries and Pûnyasālās (Houses of Charity) were quite common in ancient India. Arrian informs us in his *Indica* that the study of medicine among the Brahmans was in great favour. We know that the standard works on medicine were translated in Arabic in the 8th Century B. C., and that various medicinal herbs of Indian origin found their way into the Greek Materia Medica.

must enquire whether the medical practice of ancient times is still resorted to by the physicians of the present days. The Hindu system of medicine is still being practised all over India, more or less in its original form, and so can still be studied at first hand. But for our present purpose, we derive little or no help from the They know practically Vaids of the present generation. nothing about anatomy and surgery which began to decline during the Buddhist era, and finally all vestiges of the science became lost during the Mahomedan rule. I have spared no pains to exhaust these sources of information so far as surgical. instruments are concerned. Whether or not I have been fortunate enough to give just the necessary details of instruments from the best accessible authorities without at the same time loading my pages with superflous matter, must be left to the judgment of my readers to determine.

<sup>&</sup>lt;sup>1</sup> Beal's Buddhist Records of the Western World, Vol. I., P. 165, 198 and 214; Vol. II., p. 188 and 303.

<sup>&</sup>lt;sup>2</sup> Arrian's *Indica* c. 27.

<sup>&</sup>lt;sup>3</sup> Alberuni's India, Sachau's Preface, p. XXX—XXXI.

<sup>4</sup> Royle's Antiquity of Hindu Medicine, p. 77-113.

Now it may be asked why the Science and Art of Surgery, which was successfully practised in Ancient India, is so much neglected by the present generation of *Vaids*. So let us consider the causes that led to the downfall of Hindu Surgery:

- 1. The Hindus from a very early period have given up the dissection of human bodies—the only trustworthy method of acquiring anatomical knowledge—merely because it may occasion ceremonial uncleanliness. The Ancient Hindus were, however, free from such prejudices. Manu lays down that mere bathing will purify a Brahman who has touched a corpse, whilst stroking a cow or looking at the Sun, having only sprinkled his mouth with water will remove the defilement due to touching a dead bone. But even in the Manusamhitā, we can trace the decline of Hindu surgery, and his law forbidding any one from eating food from the hands of a doctor evidently refers to a surgeon.
- 2. The interference of the priests in India, as in Europe played an important part. They began to cure diseases by spells, charms, texts and drugs; and temples have served as consulting rooms for the treatment as much of the diseases

The Institutes of Manu, Ch. V, 85.

दिवाको त्तिं सुदक्यां च पतितं स्तिकां तथा।
ग्रवं तत्स्पृष्टिनं चैव स्पृष्टा स्वानेन ग्रुष्यति॥

श्री नारं स्पृष्टास्थि सन्नेष्टं साला विप्री विग्रध्यति । श्राचस्यैव तु निस्नेष्टं गामालभ्यार्वमीच्यवा ॥

Ibid, Ch. V, 87.

<sup>&</sup>lt;sup>3</sup> Ibid, Ch. III, 152; Ch. IV, vs. 212 and 220.

of the body as of the soul. The example of such a templo we still find in Tarakesvar where many sick people repair to have their maladies cured by dreams, hypnotic suggestions and incubation or temple-sleep. Similar practice was prevalent in Egypt and Greece in olden times. The modern practice of using galvanic rings and abdominal belts is merely an advanced method of indulging in superstitious ideas.

3. The patients always dreaded the surgeon's knife—especially when the use of a general aniesthetic was unknown. At the same time, the comparative success of poultiess, actual and potential cauteries, and other external applications have influenced the lay mind that operations by knife are not always needed. The Hindu surgeons themselves believed in similar tenets, for Susruta, the surgeon, remarks that "of all cutting instruments and their substitutes, causties (or vegetable alkalies) are the most important, because by means of them, deep and superficial incisions and scarifications may be made, and derangements of the three humours (air, bile and phlegm) may be rectified"; and again he says that "with

श्वित्योषि विना देवि स्थाविया स्वित्यामाः वेवायं स्वतं या च द्विवित्याये स्थावित्यं स्थावित्यं स्थावित्यं स्थावित्यं स्थावित्यं विवादित्यं विवादित्यं स्थावित्यं स्यावित्यं स्थावित्यं स्थावित्यं

regard to surgical treatment, actual cautery is said to be superior to caustics, in as much as diseases treated with the actual cautery do not reappear, and because it can cure diseases which are incurable by medicines, instruments and caustics." Thus we see that the Hindus were partial to external applications as a cure of surgical diseases, and gradually they neglected the surgical operations—one of the most important means of acquiring knowledge in Morbid Anatomy and of testing the correctness of diagonosis, in the absence of the post mortem examinations of the cadavers. Thus not only surgery but medicine also suffered materially.

4. The Hindus always cherish a high regard for the writings of their sages, and the earliest works on medicine became the standard works and were held sacred. Any violation of their opinions was considered a sacrilege; and all knowledge thus soon became stereotyped. In later times, none dared to question the validity of the statements contained therein, and though about three thousand years have elapsed, and though the votaries of the science are still honoured and wellpaid, the science instead of improving has markedly deteriorated. In fact, only two authors—Caraka and Susruta—are original; the later authorities—and there is a vast number of them—were merely their servile copyists who only differed from them when they indulged in some grave errors. We have a parallel in the history of medical science in Europe, where Galen

<sup>&</sup>lt;sup>1</sup> चारादिशिर्गरीयान् क्रियासु व्याखातसदृश्धानां रीगानामपुनर्भावाहेष्टुक्रश्रसचारैर-साध्यानां तत्साध्यलाच ।

held his sway over the profession for about two thousand years.

- 5. One of the potent causes of progressive decadence in the knowledge and practice of surgery amongst the Hindus is the rapid spread of Buddhism in India. Though Buddha sanctioned the use of the lancet in some cases, in cases of a doubtful nature he prohibited the use of instruments in the treatment of even surgical diseases. For example, he allowed the surgical treatment of boils by knife, but he prohibited not only the use of the lancet for treatment of fistula-in-ano but the use of clysters also. As it would be interesting to know the reasons of this prohibition, I quote the story in full from the Mohāvāgga (Sacred Books of the East):
- 1. Now when the Blessed One had remained at Savatthi as long as he thought fit, he went forth on his journey to Ragagaha; and wandering straight on he arrived at Ragagaha; and there at Ragagaha he stayed at the Veluvana in the Kalandaka-nivapa.

Now at that time a certain Bhikkhu was suffering from fistula. And the physician (named) Åkåsa-gotta lanced it. And the Blessed One when he was going round through the sleeping-places came to the place where that Bhikkhu dwelt.

2. Akasa-gotta, the physician, saw the Blessed One coming from afar; and when he saw him he said to the Blessed One: 'Let the venerable Gotama come and look at this Bhikkhu's orifice;

<sup>&</sup>lt;sup>1</sup> Mohāvāgga, VI. 14. 4 & 5.

<sup>\*</sup> Ibid, VI. 22. 3.

<sup>&</sup>lt;sup>2</sup> Ibid, VI. 22,

it is like the mouth of an iguana!' And the Blessed One thinking, 'This foolish fellow is making fun of me,' kept silence and turned away. And in that connection, and on account of that, he called a meeting of the Bhikkhu-samgha, and asked the Bhikkhus: 'Is there, O Bhikkhus, in that Vihâra a Bhikkhu who is sick?'

- 'There is, Lord.'
- 'What is the matter, O Bhikkhus, with that Bhikkhu?'
- 'That venerable one, Lord, has a fistula, and Âkâsa-gotta the physician, has been lancing it.'
- 3. The Blessed Buddha rebuked (that Bhikkhu), saying, 'This is improper, O Bhikkhus, for that foolish one, unbecoming, indecent, unworthy of Samanas, not allowable and ought not to be done. How can this foolish fellow, O Bhikkhus, allow a surgical operation to be performed in that part of his body? The skin there, O Bhikkhus, is tender, the wound is difficult to treat, the knife is difficult to guide. This will not redound, O Bhikkhus, to the conversion of the unconverted.'

And having rebuked him, the Blessed One, after delivering a religious discourse, said to the Bhikkhus: 'You are not, O Bhikkhus, to allow a surgical operation to be performed upon you in that part of your bodies. Whosoever allows that, is guilty of thullakkaya offence."

4. Now at that time Khabbaggiya Bhikkhus, since a surgical opperation had been forbidden by the Blessed One, used a clyster.

They told this thing to the Blessed One.

'Is it true, as they say, O Bhikkhus, that the Khabbaggiya Bhikkhus uso a clyster?'

'It is true, my Lord.'

He repuked them, and having delivered a religious discourse, said to the Bhikkhus: 'No surgical opperation is to be performed within a distance of two inches round the anus, and a clyster is not to be used. Whoever does so, is guilty of a thullakkaya offence.'

And thus we find that Jivaka, the famous surgeon, is said to have cured a case of fistula-in-and by the single application of an ointment.<sup>1</sup> The operation fell into such disase that when Sankaracharyya suffered from the same disease, no surgical aid was thought necessary by the physicians, though it is said that he was treated by renowned dectors of the time.<sup>2</sup>

From Megasthenes, we learn that "among the Sarmans the Hylobioi (living in woods) were held in most honour, and next to them the physicians, who are mendicants and also ascetics, like the class above them and the class below them,

Mohavagga (Sacred Books of the East), VIII. I. 15.

- विविधित्वयमम्बराक्षशैनधमर क्षीकितपहित्वसमाधाः । वाष्ट्रभपम्बविधीधमाविष्यां परिचयानकतास्य तीटकार्वः ॥ • • • • • • • • •
  - निम्मित्रे च् निमेति शिवस्था विद्याविष्टे वष्णामदसम्बियाः । न च अक्षान मदीवष्टमापदीविक्तमदः पटवी शिवसीऽभवन् ॥

Sankaravejoya, Ch. XVI.

<sup>\* &</sup>quot;And Glyaka Komärnbhakka healed the fistula of the Magadha King Seniya Bimbisåra by one anointing."

which consisted of sorcerers and fortune-tellers;" and Strabo<sup>2</sup> mentions that these physicians "cured diseases by diet rather than by medicinal remedies, which were chiefly unguents and cataplasms." •

6. No science can flourish without the support of the government of the day. The Hindus became a subject race; and any departure from the traditional store of knowledge in the shape of improvement in the quality and additions to its quantity was neither tolerated by the people, who are proverbially conservative, nor countenanced by the royal court. for the conquerors brought with them and patronised their own hakeems and doctors. Neither the Mahomedans nor the English have taken any real interest in the Indian Medical Science from preconcieved notions that it contains nothing worthy of their perusal. The Kavirajes again are so conservative in their opinions that they can . not boldly advocate even the use of such drugs as are of unquestionable value in the treatment of diseases, as for example the use of Quinine in Malaria. To this may be contrasted the behaviour of Bhavamiera, who lived about three hundred years back and who adopted many medicaments of foreign origin. The consequence can easily be imagined, and in the language of Elphinstone, can be thus described: "Physicians follow the practice of their instructor without inquiry, and surgery is so far neglected, that bleeding is left to the barber, bonesetting to the herdsman, and every one is ready to administer

The Invasion of Alexander the Great. M'Crindle. Appendices. p. 358. . -

<sup>\*</sup> The Invasion of Alexander the Great, M'Crindle, Appendices, p. 368-69.

a blister, which is done with the juice of the euphorbium and still oftner with the actual cautery."

But we need not enlarge any further. The object of this essay is not to write out an exhaustive dissertation on the Hindu mellical science but by a few suggestive facts, however imperfect and fragmentary, to stimulate curiosity and divert attention of the diligent scholars to a vast field of research, which seems as yet to have been only partially explored.

It is proper here to acknowledge that I have on all occasions freely availed myself of the labours of Drs. Wise, Thakore Saheb of Condal, and the translators of Susruta Sainhitä in the Biblotheca Indica, namely, Dutt and Hoernle. It is a great pity that this translation has not as yet progressed beyond three fasciculi. Hoerale's recent contribution, "Osteology of the Hindus," is a move in the right direction and we hope it to be followed by similar enquiries in other branches of the science. Royle for the first time proved beyond doubt the high antiquity of Hindu medicine, and established its right position in the history of the science. is the pioneer of systematic research in this field of study, and his sympathetic appreciation of the Hindu system of medicine will always be remembered with gratitude by our countrymen. Dutt's Materia Medica of the Hindus is a work of great merit; and I have derived material assistance from the excellent treatise, "History of Aryan Medical Science," by the Thakore Salieb of Gondal. Dr. Ray's History of Hindu Chembery is a valuable contribution in the cognate subject of chemistry. I have borrowed from these writers largely, but

Elphinstone's History of India, 5th Ed., p. 160.

I flatter myself it will also be found that I have further collected from various sources a store of valuable information, for which I am in no way indebted to any of my predecessors in the same field of research. The descriptions of the surgical instruments of the Greeks, the Romans and the Arabs, I have taken from the excellent English translations of Paulus Ægineta, the Extant Works of Ætius and the Genuine Works of Hippocrates, prepared by the renowned Adams, for the Sydenham Society. I have also laid the recent monograph, "Surgical instruments in Greek and Roman times" by Dr. Milne, largely under contribution; I only regret that I had no access to the book a little earlier, otherwise much of my labour in search for descriptions of the instruments of the Greeks would have been saved. For the last five years, I have been engaged on this investigation and it was when I had nearly finished, that Milne's book was mentioned to me by the Hon'ble Mr. Justice Asutosh Mookerjee, the Vice-Chancellor of the Calcutta University and the President of the Asiatic Society of Bengal.

To complete the subject, I have added plates of nearly all the varieties of instruments; but they are more or less hypothetical as we do not possess any actual specimens of the instruments of the Hindus. Written descriptions of surgical instruments are uninteresting and often fail to convey the true idea, which could be easily made evident by the pencil. For purposes of comparison I have given drawings of instruments of the Greeks, the Romans and the Arabs, when I thought that they might be of value for the proper elucidation of my subject. I am indebted to many authors

I am indebted to many authors for some of the engravings of the instruments. I have been careful to give the source whence the borrowed ones are taken, as far as I have been able to ascertain them. If this has been omitted in any case, it is from inadvertence, not from design. My best thanks are due to them and I here acknowledge my indebtedness to the authors for availing myself of their labours without their permission. But many new illustrations will be found, and I have appended my name to those drawn by myself. These figures of the surgical instruments would be found to tally better with the descriptions of the instruments given in the Sanskrit books than the illustrations of the previous authors. The drawings of surgical instruments as given by me would look more like the figures in a modern catalogue of surgical instruments. Some of my friends could hardly believe when they saw the plates that these instruments were known to the ancient Hindus at such an early age. This feeling of amazement and incredulaty as regards the surgical instruments used by the ancient Hindus has its parallel in the observations of Billroth<sup>1</sup> about the surgical instruments found in the excavations at Pompeü and now preserved in the museum at Naples. He says: "It made a pecular impression upon me, when I saw before me this two thousand years old surgical armamentarium of a Roman colleague, differing but slightly in the form of the more ordinary instruments from those of our Ars longa vità brevis." Milne2 also remarks: "The works of those (Paré, Scultetus and Heister) are profusely illustrated with instruments, some of which can plainly be seen to tally exactly with the descriptions of the classical authors."

Billroth's Surgery, Vol. I, Introduction, Page 7. Syd. Soc. Ed. ...

<sup>•</sup> Græco-Roman Surgical Iustruments, P. 8.

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In describing the surgical instruments, I have confined myself strictly to the texts of the authors and commentators whom I have quoted, and have given the original Sanskrit passages in the foot-notes. These will be of great help to scholars who will try to study the subject at first hand, and prosecute further historical inquiries. The references in the foot-notes do not refer to pages of any particulars edition of the work, as such pagination causes inconvenience to the readers who may not secure the edition in question; so we have given the section, and chapter of the book which will be found in any edition.

In the translations of Sanskrit passages, I have endeavoured to follow the original as closely as possible, except where a somewhat free rendering was necessary to make the meaning clear.

The dates of the ancient Hindu authors of Sanskrit medical books cannot be ascertained with certainty. In the first chapter I have endeavoured to discuss briefly their approximate ages. But as I have compared the surgical instruments of the ancient Hindus with those of the Greeks, Romans and Arabs, a concise summary of the chronological dates of the Græco-Roman, Arab, and the later authors would be a great help in the proper elucidation of my text.

Authors.		Date.					
Pythagoras		580-504 B.C.	,				
Megasthenes	•••	300 B.C.					
Ktesias	•••	400 B.C.					
Hippocrates	::•	460 B.C.					
Hero of Alexan	drie	\$85-232 B C					

Authors.	•	•	Date.
Dioscorides	•••		First century A.D.
Celsus			25-30 B.C. to 45-50 A.D.
Scribonius Largus	•••		45 A.D.
Soranus	•••		First century A.D.
Rufus of Ephesus	•••		98-117 A.D.
Galen	•••	•••	131-201 A.D.
Marcellus Empirio	eus	•••	300 A.D.
Antyllus	•••		3rd century, A.D.
Oribasius	•••		326-403 A.D.
Theodore Priscian	us		4th century A.D.
Caelius Aurelianus	3		4th or 5th century A.D.
Moschion	•••		5th century A.D.
Actius	•••		5th century A.D.
Alexendar of Trall	les	•••	525-605 A.D.
Paulus Ægineta		•••	660 A.D.
Serapion	•••		800 A.D.
Rhazes	•••	•••	850-932 A.D.
Haly Abbas			After 950 A.D.
Avicenna	•••	•••	980-1037 A.D.
Abul Cassim	•••		x 1106 A.D. •
Avenzoar	•••		x 1162 A.D.
Paré	•		1509-90 A.D.
Scultetus	•••	•••	1650 A.D.
Heister	•••		1739 A.D.

I can not suffer this work to go forth without offering at least an explanation of, if not an apology for, the delay which has occurred in the publication of this thesis. It is mainly due to the accidental fire which reduced the types and the blocks.

for this work to ashes and distroyed a part of the manuscript. This portion had to be written again. Again the task of reading proof sheets was laid on me entirely. The occupation of a laborious profession encroached on my time; and I was not fortunate enough to secure the co-operation of any worker in this field of research. The result might be anticipated and no one is more conscious of the unsatisfactory issue than myself. had no experience in proof reading, and so mistakes are not Some of the errors will be found corrected uncommon. in the corrigenda. As regards the corrections of many of the proof sheets of the Sanskrit foot-notes I was assisted by my son Hirendranath Mukhopadhaya, who helped me much in getting this book completed. The author will feel obliged if informed of any errors that may be detected and of references to informations which ought to have been given, and also for any hints that may make a future edition more useful to the readers. I have this consolation in my mind that I have not pushed this work through the press hurriedly or prefunctorily and I have done my best. I have laboured with the usual drawbacks of an active professonal life and if this be admitted by the critic as an excuse for errors and failures, I shall be grateful to him.

A copious index has been provided for this work, whereby anything material in the whole book may be readily found out; of which it may be said that it wants no other advantages than such as the author had not power to give.

It would not be out of place here to mention that part of this essay was read before the Asiatic Society of Bengal in June, July and August, 1908. The learned President in his annual address remarked as follows: "In the course of the last

for this work to ashes and distroyed a part of the manuscript. This portion had to be written again. Again the task of reading proof sheets was laid on me entirely. The occupation of a laborious profession encroached on my time; and I was not fortunate enough to secure the co-operation of any worker in this field of research. The result might be anticipated and no one is more conscious of the unsatisfactory issue than myself. I had no experience in proof reading, and so mistakes are not Some of the errors will be found corrected in the corrigenda. As regards the corrections of many of the proof sheets of the Sanskrit foot-notes I was assisted by my son Hirendranath Mukhopadhaya, who helped me much in getting this book completed. The author will feel obliged if informed of any errors that may be detected and of references to informations which ought to have been given, and also for any hints that may make a future edition more useful to the readers. I have this consolation in my mind that I have not pushed this work through the press hurriedly or prefunctorily and I have done my best. I have laboured with the usual drawbacks of an active professonal life and if this be admitted by the critic as an excuse for errors and failures, I shall be grateful to him.

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It would not be out of place here to mention that part of this essay was read before the Asiatic Society of Bengal in June, July and August, 1908. The learned President in his annual address remarked as follows: "In the course of the last session Dr. Girindranath Mukerjee submitted to the society a paper of considerable extent, in which he elaborately examined the subject of the surgical instruments of the ancient Hindus. The questions he has raised, as to the priority of Hindu medicine over that of the Greeks, the Romans and the Arabs, are likely to arouse controversy, but in whatever way the question of priority may be decided, it seems to me truly remarkable that the descriptions given in our most ancient books on medicine, of the surgical Instruments then in use, should bear a close resemblance to the descriptions given not only in Greek, Roman and Arab medical writings but in many cases with the descriptions given in medern works on surgery. I trust that this subject, so peculiarly Indian, will not be left alone and will receive the attention from investigators which it undoubtedly deserves."

As regards the transliteration of Sanskrit words, we have employed the method adopted in the Congress of Orientalists and circulated in the Journal of the Royal Asiatic Society, ignoring in fact, the unpleasant characters of the Sacred Book of the East.

Journal and Proceedings of the Asiatic Society of Bengal, Vgl. V, 1909, Annual Address, p. XXX.

I SANSKRIT AND ALLIED ALPHABETS.

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1. The Svastika yantra or cruciform Instruments: Simhamukha svastika or Lion-faced forceps. Vyāghramukha or Tiger forceps. Vrkamukha or Wolf forceps. Tarak sumukha or Hyena forceps. Rksamukha  $\mathbf{or}$ Bear forceps. Dwipimukha or Panther forceps. Mārjāramukha or Cat forceps. Srgālamukha or Jackal forceps. Airbbāruka or Deer forceps. Kankamukha mukha or Crow forceps. Heron forceps. Kuraramukha or Osprey forceps. Cāsamukha or Blue-Jay forceps. Bhāsamukha or Eagle forceps. Śaśaghātīmukha or Hawk forceps. Ulukamukha or owl forceps. Cillimukha or Kite forceps. Syenamukha or Vulture forceps. Grdhramukha or Falcon forceps. Krauńcamukha or Curlew forceps. Bhrigarājamukha or Butcher-bird forceps. Añjalikarna forceps. Avabhañjanamukha forceps. Nandimukha forceps. II. The Sandamsa or Pincherlike forceps: Forceps with and without handles. Forceps with Smooth and rough ends. Mucuti Mucundī. orEpilation forceps. Vamsabidala or Bamboo forceps. III. Tāla-Vantra or Picklock-like instrument: Ectāla and Dvitāla. The Ear-scoop. IV. The Nadī-Yantra or Tubular instruments: Kanthasalyāvalokinī or Throat speculum. Pancamuka and Tubulur instruments for inspec-Trimukha. tion of arrows. Salvanirghātanī. The Impellent. Tubular instruments for Piles—for inspection and medication. Samī. The Rectal Speculum. Calopter. Tubular instruments for the Fistula-in-ano. Tubular instruments for the nose: Nasal Speculum. Nathu-karanī Yamaka-nathu-karani. Nasal tubes. The Finger-guard. Anguli-trānaka or Vraneksana or Vaginal Speculum. Diopter. Bivalve Speculum. The tubular instruments for wounds—Vrana-vasti or Wound-Syringe. . Tubular instrument for ascites. Dākodara yantra or Canula. Tubular instruments for Hydrocele. Tubular instruments rectal  $\mathbf{for}$ stricture. Tubular instruments for injection into the rectum-Vasti Yantra or Rectal Uttaravasti or urethral, vaginal and uterine tubes. Catheters. Tubular instruments for inhalation and fumigation. Disinfection of rooms. clothes &c. Tubular instruments for cupping. Śriga or horn. Alābu Yantra or gourd. Ghati Yantra, V. Salakā

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or rods: Earthworm probes. Arrow probe. Snake's hood probe. Fish-hook probes. Śańkus; Swab probe. Spathomele or spatula probe. Spoon-shaped probes. Cyathiscomele. Nail-shaped probes. Jāmvavaustha probe. Gamma-shaped probe and the ankuśa cautery. Collyrium probes. Karna Sodhana or Ear-Garbha-Śanku or Fœtus or Traction cleaner. Yujña-Śańku or Midwifery forceps. Sarpa-fana or snake's hood-like rods. Stone Hippocratic oath. extractor. Sarapunkhamukha Probe. Arddhacandramukha or Halfmoon Probe. Bone Lever. Director, Urethral Probe. VI. The Upayantra or Accessory Instruments. Rajju or thread, Venikā or twine; Patta or Bandages, Abdominal binder, Field Hospital, Dressings. Carma or leather: leather bandage, leathar ligatures. Yantra-Sataka or Lithotomy Strap or binding paratus, Pāśa. Leather bags. Śīrovasti or leather-bag for the head. Leather Band. Leather Bottles, Jars, etc. Antarvalkala or Barks. The crutches, Tendrils of creepers or Latā. Vastra or cloth. Asthilāsma or stone. Mudgara or Hammer. Pānipadatala or hand and foot. Anguli or fingers. Jihvā or tongue. Danta or tooth. Nakha or nails. Mukha or Probang. mouth. Vāla or hair. material. Asvakataka or the ring of a horse's bridle. Śākhā or branch of a tree. Sthīvana or spittle. Pravahana or fluxing the patient. Har a or Happiness. Ayaskanta or Load-stone. Ksāra or Caustics or Potential cautery. Agni or Actual cautery. Bhesaja or medicines. Goats' gut; Arrest of hæmorrhage.

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CALCUTTA.

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# Surgical Instruments of the Hindus.

### CHAPTER I.

# INTRODUCTION.

#### ANCIENT MEDICAL AUTHORS AND THEIR WORKS.

The Science and Art of Medicine, like many other different branches of learning originated with the Hindus. They consider the art of healing as an Upaveda and it is generally known as Ayurveda, that is the art of prologing life. Like the Vedas, they trace the origin of the science to God, the fountain of all true knowledge. Bramhā transmitted this heaven-born science to this world for benefit of the mortals in one of the sacred writings, the Ayurveda.

It was composed as a sub-division of the Atharva Veda and consisted originally of a *lākh slokas* or a hundred thousand stanzas, divided into a thousand chapters. Then considering the short span of life and inadequate intelligence of man, he divided the book into eight parts as follows:—

¹ तद्यथा॥ भ्रत्यं भ्रालाकः कायचिकित्सा भूतिवद्या कौमारभृत्यमगदतन्त्रम्
रसायनतन्त्रं वाजीकरणतन्त्रमिति॥
Susruta Samhitā. I. i.

कायचिकित्सा शालाक्य शब्यहर्तृकं विवगरवैरोधिकप्रश्मनं भूतविद्यां कौमारस्टलकं रसायनानि वाजीकरणमिति। Caraka Samhita, I. xxx.

वेदी स्नाधर्कमः खस्ययनवित्तमङ्गलहोमनियमप्रायश्चित्तीपवासमन्नादिपरिग्रहात् विकित्सां प्राहः।

Ibid.

- 1. Śalya Tantra or Major Surgery.
- 2. Śālākya Tantra or Surgery of parts above the Clavicles.
- 3. Kāya Cikitsā or Inner Medicine.
- 4. Bhūtvidyā or Demnology.
- 5. Kaumārabhṛtya or the Science of Pædiatrics.
- 6. Agada or Toxicology.
- 7. Rasāyana or Treatment to prolong life.
- 8. Vājīķaraņa or Treatment to stimulate the sexual power.

The book is no more available now, Susruta being the authority for the above information.

A different view is held by others, who trace the origin of Hindu Medicine in the verses of the Rgveda.<sup>2</sup>

इह खल्वायुर्वेदी नाम यदुपाङ्गमयर्व्ववेदस्यातृत्वादेव प्रजा: श्लीकश्रतसङ्ख-मध्यायसङ्खञ्च क्रतवान् स्वयः । ततीऽल्यायुङ्गस्यमेधस्वाञ्चावलीक्य नराणां भूयीऽ एधा प्रणीतवान्॥

Suśruta Samhitā, I. i.

तत्र चित् प्रष्टारः स्ताः चतुर्णाष्टकसामयनुरधर्व्ववेदानां कं वेदमुपदिश्वन्यायुर्व्वेदिवदः। किमायुः कस्मादायुर्वेदः किञ्चायमायुर्वेदः श्राध्वतीऽशाध्वत इति। कानि चास्त्राङ्गानि कश्चायमध्यत्रव्यः किमर्थञ्चेति॥

तत्र भिषजा पृष्ठेनैवं चतुर्णाम्धन्सामयजुरधर्ववेदानाम् भातानीऽधर्ववेदे भिक्तरादेश्या । Caraka Samhitā, I. xxx.

The origin of medical science, as quoted in the above passage of Caraka, does not however agree with the view expressed by the author in the Sūtra Sthāna, Ch. I. (See footnote 1. P. 4). In Ch. XXX, we find that an attempt had been made to make a compromise between the two views of Agnivesa and Susruta. Evidently this was the work of a later redactor, possibly Drdhavala.

न च्यायुर्वे दस्ताभ्लीचिरपलभ्यते । श्रन्यचाववीधीपरिश्रास्थामेतदै इयमधिकत्य उत्पत्ति-सुपरिश्रन्थेके खाभाविकचास्त्र लचणमधिकत्य यदुक्तम् दृष्ट चार्छचाद्व्यारे \* \* \* !!

<sup>2</sup> : ऋग्वेदस्यायुर्वेद उपवेद: ।

. Caraka Samhita, I. xxx.

Carana Vyūha by Vyāsa.

### ATHARVA VEDA.

"On examining the contents of the Atharva Veda more in detail, we find that the hostile charms it contains are directed largely against various diseases or the demons which are supposed to cause them. There are spells to cure fever (takmān), leprosy, jaundice, dropsy, scrofula, cough, ophthalmia, baldness, lack of vital power, fractures and wounds; the bite of snakes or injurious insects, and poison in general; mania and other ailments. These charms are accompanied by the employment of appropriate herbs. Atharva Veda is the oldest literary monument of Indian This Veda can not belong to a period later Medicine."1 than 1000 B. C., but possibly earlier.2 It exists in the recensions of two different schools. That of the Paippalada is only known in manuscript, discovered by Prof. Buhler in Kashmir and described by Prof. Roth in his tract Der Atharva Veda in Kaschmir (1875). The printed text, edited by Roth and Whitney in Berlin 1856, gives the recension of the Saunaka School.<sup>3</sup> It has been translated into English Prose by Whitney, 2 Vols.; into English verse by Griffith, 2 Vols., Benares, 1897, and with the omission of the unimportant

<sup>&</sup>lt;sup>1</sup> Mcdonnel's Sanskrit Literature, P. 196.

चयर्चवेदस्य \* \* \* \* चतुर्थं वेदलेऽपि प्रायेणाभिचारवर्थेलाद्यज्ञविद्यायामनुप-योगाचानिर्देश:। तथाहि च्यवेदेनैव हीचं कुर्वन् यज्ञवेदेनाध्ययंवं सामवेदेनीद्वाचं यदेव नयी विद्याय स्कलोन ब्रह्मलिमित्युते स्वयीसन्पादालं यज्ञानो ज्ञायते।

Kallūka Bhatta's Commentary on Manu Samhitā,. Ch. III, Śloka I.

<sup>&</sup>lt;sup>2</sup> On the date of Atharva Veda, see pp. CXL—CLXI, Prof. Lanman's Edition of Whitney's Transl.; Prof. Modonnel's Sanskrit Literature, pp. 185—201.

<sup>3</sup> Index Vervorum in the Journal of the Am. Or. Soc. Vol. XII.

hymns, by Bloomfield<sup>1</sup> into English Prose, with notes, in Vol. XLIII of the Sacred Books of the East.

### CARAKA SAMHITA.

In the Caraka Samhitā we find that Brahma taught Dakat the science of medicine; Dakṣa became the preceptor of the Aśvin twins; they in their turn became the teachers of Indra and Indra imparted this knowledge to Bharadvāja who was sent by a conclave of sages to learn the art for the welfare of the human race. Bharadvāja had Punarvasu Ātreya and the others as disciples. Ātreya's students were Agniveśa, Bhela, Jatukarṇa, Parāśara, Hārīta and Kṣārapuṇi, all of whom became celebrated as the authors of treatises on Medicine; the Caraka Samhitā being a revised and improved edition of the treatise of Agniveśa, which was declared to be the best production. Caraka did not, however, reduct the whole

Caraka Samhita, I. i.

<sup>&</sup>lt;sup>1</sup> He has also edited the Kausika Sütra of the Atharva Veda, with extracts from the commentaries of Därita and Kosava (see Vol. XIV donra. Am. Orient. Soc.). It is very useful as a help to the proper understanding of the meaning of a hymn.

वैर्घिक्षीवितमिखिक्कन् भरहाज उपागमत्। इन्द्रमुग्रतपा बुद्धा श्ररखमगरिवरम्॥ ब्रह्मणा हि यथा प्रीक्तमायुर्व्वेदं प्रजापति:। ङ्घगाह निखिलेनादाविवनो तु पुनस्तत:॥ अश्विभ्यां भगवान् श्रक्तः प्रतिपेदे ह कीवलम्। ऋषिप्रोक्ती भरहाजस्तसाक्क्रसुपागमत्॥

<sup>3</sup> श्रथ मैनीपर: पुर्णसायुर्वेद पुनर्व्वसु:। शिष्येभ्यी दत्तवान् षड्भ्य: सर्व्वभ्तानुकम्पया॥ श्रितिश्व भेलय जतुकर्णः पराश्वरः। हारीतः चारपाणिय जग्रहुस्तमुनेर्वेचः॥ वुद्धेर्विशेषस्त्रनासीद्गीपदेशालरं मुनेः। तत्त्वस्य कर्त्ता प्रथममग्निवेशो यतीऽभवत्॥ श्रथ भेलादययन्नु स्व स्वं तत्वं न्नतानि च। श्रावयामासुरानेयं सर्विस्तं सुमेषसः॥

book;—the last forty-four chapters¹ were edited by Dṛḍhavala,² a native of Panchanadapura, long supposed to refer to Punjab (the land of five rivers) but at present identified with a town in Kashmir by Dr. Hoernle.³ Two other works, the treatises of Bhela and Hārīta, are still extant; the former existing in manuscript in the Tanjore Library⁴ and the latter as printed texts by Kavirājes K. C. Sen and B. L. Sen, of Calcutta.⁵

Now as regards the age of Caraka, there is great divergence of opinions. The Indians generally believe him to be a Rsi of great antiquity while the European scholars try

श्वतस्त्रलोत्तमिमदं चरकेणातिवुद्धिना। संस्कृतं तत् तु संख्रष्टं विभागेनीपलच्यते॥ इदमन्यून्यव्दार्थं तन्त्रं दीषविवर्ज्जितं। श्वत्यखार्थं दृदवजी जात: पश्चनदे पूरे॥ काला वष्ट्रश्यसन्त्रेशी विश्रेषाच वलीचयम्। सप्तदश्रोषधाध्यायसिद्धिकल्पेरपूर्यत्॥

2

Caraka Samhitā, VIII, xii.

मिस्तिन् सप्तद्याध्यायाः कत्याः सिद्धय एव च । नासाद्यन्तेऽग्निवेशस्य तन्ते चरकसंस्कृते ॥ तानेतान् कापिलवन्तः श्रेषान् दृढवन्तीऽकरीत् । तन्तस्यास्य महार्थस्य पूरणार्थं यथातथम् ॥

Ibid, VI, xxx.

- <sup>3</sup> Hoernle's Studies in the Medicine of Ancient India, Part I, Osteology, Introduction, p. 2. See also his article on "The authorship of Caraka Samhitā" in the Archiv für die Geschichte der Medizin, 1907.
  - 4 See Burnell's Tanjore Catalogue No. 10773 of Sanskrit Mss., P. 63.
- It is doubtful whether the Hārīta Samhitā is the genuine work of the
   Rṣi, Hārīta. The printed text refers to Caraka, Suśruta and even Vāgbhaṭa, who were decidely posterior to Hārīta, See the Footnote 3, P. 6.

<sup>&</sup>lt;sup>1</sup> For a discussion on the part added by Drdhavala, see Hoernle's Studies in Ancient Indian Medicine, J. R. A. S. 1908, P. 997-1002. Also see pp. 11-15 in the Vanauşadhi Darpaṇa, Vol. I., by Kavirāja Bīrajā Charan Gupta, 1908.

to connect him with historical events of more modern times. Sylvain Lévi has recently discovered in the Chinese Translation of the Buddhist *Tripitaka* that Caraka was the Court Physician of the Indo-Scythian King Kaniska, in the first century A.D.<sup>1</sup> But the following objections are to be met with before his conclusions can be accepted as proved:—

- 1. The age of Kaniska is not yet settled, the probable limits of his reign being from the first century B. C. to the second century A. D.<sup>2</sup> Moreover in the Buddhist *Tripitaka* referred to, the name of Caraka is simply mentioned as the Court Physician of the King Kaniska but there is nothing to identify him with the author of the book. The same name, found in different places, does by no means signify the same person.
- 2. The time assigned to Caraka by the Indian medical tradition is of great antiquity. With regard to the chronological position of the three old authors, he is mentioned as anterior to Suśruta and Vāgbhaṭa I.³
- 3. Dr. Ray has pointed out that the name Caraka is patronymic in the Veda. It is quite possible that a much

Hārīta Samhitā, Parisistādhāya.

<sup>&</sup>lt;sup>1</sup> See Journual Asiatique—July to December 1896, p. 444 to 484 and January to June 1897, p. 5 to 42; also Indian Antiquary Vol. XXXII, 1903, p. 382 and Viena Oriental Journal, Vol. XI., p. 164.

<sup>&</sup>lt;sup>2</sup> See V. A. Smith's Early History of India, P. 225-26.

Dr. Fleet in J. R. A. S., 1906, P. 979.

Dr. Bhandarkar in J. R. A. S. (Bombay Branch), Vol. XX, P. 269.

J. A. S. B. Vol. XXXIX, 1870, p. 65 and 126.

उप्तः सुयुत्यैव वाग्भटम्च तथापर: । मुख्याम्च संहिता बाच्यास्त्रिस एव युगे युगे ॥ मित: क्रतयुगे वैद्यी हापरे सुयुती मत: । क्रत्वी बाग्भटनामा च गरिमाच प्रदृष्यते ।

<sup>4</sup> Dr. P. C. Ray's History of Hindu Chemistry, Introduction, P. X.

later namesake of his, is referred to by the *Tripitaka*, just as we know that more than one Vagbhaţa appeared as successful physician. Again we have evidence that eminent physicians in later times were called Caraka by way of a compliment and so Vagbhaţa was called Caraka of Sindh or Sindhicara.

- 4. Pāṇini wrote special Sūtras for the Agniveśas and the Carakas. These names must have been famous before Pāṇiṇi's time, otherwise he would not have written special Sūtras for them. Prof. Goldstucker has conclusively proved that Pāṇini could not have flourished later than the sixth century n. c.\*
- 5. Patanjali wrote a commentary on Caraka. He flourished during the second century B. c. Both Cakrapānidatta and Bhoja allude to him as the redactor of Caraka Sanihitā. So Caraka must have flourished long before him, for unless his work was regarded as a standard work of authority. Patanjali would not have taken so much pains to write notes on the book, and still more for issuing a redaction.
- 6. The internal evidence of the book itself speaks against such an assumption. There is no salutation to any diety at the

मर्गोदिन्दी यश्व ॥ 1661, 4, 1, 105.

अमे । बन्सा \* \* \* \* पश्चित्र \* \* \* \* परागर । जनुकार्थ । \* \* \*.

Quoted in Laghumanjuşa of Nagesa Bhatta (Ray).

मनीवाक् कायदीवाचान् कर्केऽविपतये नमः ॥

Vide salutation in the Ayurvedarthadipika.

<sup>&</sup>lt;sup>4</sup> कटचरकाञ्चक । Papini 4, 3, 107.

<sup>\*</sup> Goldstucker's Papini; and Journal of the Asiatic Society of Bengal, Vol. NLH, P. 254.

<sup>&</sup>lt;sup>3</sup> चार्गीनास भन्भवेन बसुतत्वसा कात्केंन निषयवान्, रागादिवज्ञादपि नात्वधावादी व: स इति चरके पतक्षिः।

पातश्रम-महाभाषा-चरवपतिमस्त्रते:।

beginning of the book,—a custom invariably found to be observed in the more modern compilations. There is complete absence of Paurānic theology in the Caraka Samhitā, nor is there any reference to Sākya Muni and his religion. Kaniska was a great patron of Buddhism, and it might naturally be expected from the Court Physician of the king to describe the charitable hospitals which we know from the edict of Asoka, to have flourished in every quarter of India. On the contrary we find descriptions of a hospital as reserved for rich men only at their own houses. Those gods and godesses that figure so prominently in the Purānas were unknown during his time. 1 Beef was not then, apparently, a

Caraka Samhitā, VI, xxv.

But Kṛṣṇa and Vāsudeva are mentioned in Pāṇini as demigods, having many adherents who formed a class. "वास्ट्रेवार्ज्जनायां वृन' Pāṇini, 4. 3. 98. Again the passage may be an interpolation of a subsequent Vaiṣnaba Vaid.

So Bṛṣavadhvaja is also mentioned in Dṛdhavala's Supplement, as a god to be worshipped during the preparation of some medicines:

ब्रह्मचीषग्रङ्गपटङ्भिरीनिनादैः सिङ् सितक्कत्रक्ततक्कायं •गजस्त्रस्थमारीपयेङ्गगवन्तं इषध्वनसभिपूच्य तं स्रेष्ठं तिभागमाचितंमक्रवाग्रीःस्तुतिदेवतार्चनैर्वेस्तं गमयेत्॥

Ibid, VIII, xii.

<sup>&</sup>lt;sup>1</sup> No doubt the names of Laksmī, Kṛṣṇa and Vāsudeva occur in Cikitsita Sthānam, Chapter XXV, but it should be remembered that they occur in the Supplement added by Dṛḍhavala in later times.

forbidden food, for it is spoken of as an article of diet that should not be indulged daily, nor should it be used in excessive quantity as it is mentioned as a cause of the disease, Vāta-Rakta.<sup>2</sup>

The style of the book is antiquated and decidedly savours that of the Brāhmaṇas. Nāya and Vaisesiki systems occur in the text,<sup>3</sup> and so probably the book was written long before the compilation of these Sūtras.

Editions.—The book had undergone several editions. It was edited by Jībānanda Vidyāsāgar, Calcutta, in 1877 and 1896 (2nd Ed.); by Gangādhar Kaviratna, Berhampur, 1879; by Gupta, Calcutta, 1897; with commentary by Cakrapāṇidatta, Calcutta, 1892-93; by Jasodānandana Sarkār, with Bengali translation, 1894.

Translations.—It had been translated into English by A. C. Kaviratna, Calcutta, 1897. Caraka was translated from Sanskrit

And we find that the antidote to poisen called महागलहसी is said to have been told by Tryambaka (Siva) to Baiśravana (Kuvora):

### भादीऽसं वैश्ववणाख्यातन्यस्वतेण षष्ट्राङः।

Caraka Samhitā, VI. xxv.

Also we find the name of Karttikeya mentioned in Sec. IV. clf. viii.

प्रसुव त्वमविक्किष्टमविक्किष्टा ग्रभानने, कार्त्तिकेययुति पुच कार्त्तिकेयाभिरचितमिति॥

. कुर्बिकां व किलाटां य शौकरं गव्यम्मिनं । मत्मान् दिघ च माषां य यावकां य न शौल येत्

कुलत्यमाषनिष्पावशाकादिपलले नुभि:।
 दश्वारनालक विरयुक्ततकसुरासवै:॥

3 Vide Caraka, III. viii.





into Arabic in the beginning of the eighth century and his name "Sharaka Indianus" occurs in the Latin translations of Avicenna, Rhazes and Serapion. "A translation of the Karaka¹ from Sanskrit into Persian and from Persian into Arabic is mentioned in the Fihrst, (Finished 987. A.D.). It is likewise mentioned by Albērūnī²; the translation is said to have been made for the Barmekides." Albērūnī's chief source on Medicine was "Caraka, in the Arabic Edition of Ali Ibn Zain, from Trabaristan."

#### Commentaries \_\_\_

- 1. Patanjali-2nd century B.C.-not available.
- Cakrapāņidatta's Caraka Tātparya Tīkā, or Āyurvedadīpikā<sup>5</sup>—1060 A.D.
- 3. Haricandra 1111 A.D. not available.
- 4. Śibadāsa's Caraka-Tattva-Pradīpikā.
- 5. Gangadhar's Jalpa-Kalpa-Taru—1879 A.D.

श्रीसाइसाङ नृपतेरणवद्यविद्य-

वैद्यीचरङ पदपडतिमेव विधत्। यसन्द्रचारुचरिती इरिचन्द्रनामा

सद्माख्यया चरकतत्त्रमलंचकार ॥

<sup>&</sup>lt;sup>1</sup> Proceedings of the As. Soc., Bengal, 1870, September.

<sup>&</sup>lt;sup>2</sup> Reinaud, Memoire sur l'Inde, P. 316.

Maxmuller's Science of Language, Vol. I., P. 168, Foot Note.

Sachau's preface to India, P. XL.

See Caraka Samhitā with Cakrapānidatta's Commentary by Kavirāja Harināth Visārada, Calcutta, 1895.

Slokas narrating the geneology of Maheśvara, the author of Viśvaprakāśa and Sāhasānkacarita, who flourished during the reign of Sāhasānka, king of Gazipur in 1033 Saka (1111 A. D. Wilson).

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- 3. Haricandra<sup>6</sup>—1111 A.D.—not available.
- Śibadāsa's Caraka-Tattva-Pradīpikā.
- 5. Gangadhar's Jalpa-Kalpa-Taru—1879 A.D.

श्रीसाहसाङ्क टपतेरणवद्यविद्य-

वैद्यीत्तरङ पटपडितिमेव विसत्।

यसन्द्रचारुचरिती इरिचन्द्रनामा

सद्माख्यया चरकतन्त्रमलंचकार ॥

<sup>&</sup>lt;sup>1</sup> Proceedings of the As. Soc., Bengal, 1870, September.

<sup>2</sup> Reinaud, Memoire sur l'Inde, P. 316.

Maxmuller's Science of Language, Vol. I., P. 168, Foot Note.

Sachau's preface to India, P. XL.

See Caraka Samhitā with Cakrapānidatta's Commentary by Kavirāja Harināth Viśārada, Calcutta, 1895.

<sup>&</sup>lt;sup>6</sup> A Commentary written by Haricandra is referred to in the Sanskrit Slokas narrating the geneology of Maheśvara, the author of Viśvaprakāśa and Sāhasānkacarita, who flourished during the reign of Sāhasānka, king of Gazipur in 1033 Saka (1111 A. D. Wilson).

# SUŚRUTA SAMHITĀ.

The next treatise on Hindu Medicine is the Suśruta Samhitā. Suśruta was the son of the sage Viśvāmitra,¹ a contemporary of Rāma. He learned the Science of Medicine from Divodāsa, surnamed Dhanvantari, king of Benares, at his Himalayan retreat. According to Suśruta, Divodāsa was the incarnation of Dhanvantari, the celebrated physician of the gods in heaven, and he first propounded the Art of Healing in this world.² Suśruta represented the Surgical School while Caraka was pre-eminently a Physician in practice.

As regards the authorship of the book, opinions differ. To Suśruta, Dhanvantari addressed his lectures on Major Surgery,<sup>3</sup>

<sup>1</sup> Mahābhārata, Anuśāṣana Parva, Ch. 139, Vs. 8-11.

धन्वन्तरिर्धर्यास्तां वरिष्ठो वाग्विशारद:। विश्वामितात्मजस्विं शिष्यं सुश्रुतमख्यात्॥

Suśruta Samhitā, V. ii.

भराक्यर्वेदिवदं दिवीदासं महामति । हित्तमास्त्रार्थसन्देष्टं सूचमागाधमिवीदिधि । विम्बामिवसृतः श्रीमान् सुयुतः परिष्टक्हति ।

Ibid, VI. lxvi.

सर्वेशास्त्रार्थतत्त्वज्ञ सपीदृष्टि बदारघी: । वैत्रानितं शशासाय शिव्यं काशिपतिम्मुनि:॥

Ibid, VI. xxviii.

- श्रय खलु भगवन्तममरवरसृषिगणपरिष्ठतमाश्रमस्थं काश्रिराजं दिवीदासं घन्वन्तरिः मौपञ्चनवैतरणौरभपोष्कालावतकरवीर्थगोपुररचितसृशुतप्रस्तय ऊत्तुः।

  Ibid, I. i.
- अस्य तसी किमुखतामिति। त जातुः। सस्मानं सर्वेषामेव श्रत्यज्ञानमृतं क्रिलोपिदिशतु भगवानिति। स उवाचैवमितृति। ...... सम्मानमेनमतीनां मतमिसस्मीत्य सुश्रती भगवन्तं प्रत्यति.।
  Ibid, I. i.

which he reproduced in this work. But in the opening lines of the book, salutation is offered to Brahma, Daksa, Aśvins, Indra, Dhanvantari, Suśruta and others. This shows that Susruta can not be the author of the work or at least of the work in its present shape, for no author can offer salutation to himself. By "the others" are no doubt meant the notable surgeons who practised and taught the Science of Surgery and who were either contemporary with or posterior to Susruta. Possibly the original Suśruta Samhitā had been recast and the redactor could appropriately offer a salutation to the original author and to other surgeons who flourished before him. is also an Indian medical tradition, noted in Dallapacarya's Commentary, which assigns the improved and supplemented edition of Suśruta's original work to Nāgārjjūna, the celebrated Buddhist Chemist, who is said to have been a contemporary of the king Satvahana.3

In the third chapter, Susruta enumerates the subjects described by him,—the chapter forming an index of the book. Therein he mentions the five principal divisions of his book and says that the Uttara Tantra or the Supplement would be

Suśruta Samhitā, I.

नमी ब्रह्मप्रजापत्यश्विवलभिद्धन्वन्तरिसुयुतप्रसृतिभ्यः।

<sup>2</sup> यत यत परीचे नियोगसात तत्रैव प्रतिसंस्तर्मु स्तं ज्ञातव्यमिति। प्रतिसंस्तर्भाषीइ नागार्ज्ञुन एव।

Dallana's Commentary to Susruta, I. i.

See also Dr. Cordier's Recentes Decouvertes, pp. 12-13.

See Harsacarita by Vāṇa.

Beal's Buddhist Rocords of the Western World, Vol II., P. 209, 212, 216.

Burgess' Archeological Survey of S. India.

Introd. a l'histoire du Budh. Ind., P. 508.

described afterwards.¹ Now the fact that the sixth part was, appended to the work as a Supplement or Uttara Tantra (i.e., after treatise) clearly shows that it was written afterwards by another surgeon and added to the original treatise. If the original Susruta wished to have six divisions of his book, he would have mentioned it clearly in the index and would not have, after stating that his book consisted of five parts, added that "the Supplement would be described afterwards,"² which seems to be an interpolation of the Supplementor to pass his edition as the original work of the author. Again at the end of the fifth section, there is a passage describing the importantce of the Ayurveda, which was meant as the conclusion of the book by the author. It is to be noted

भध्यायानां शतं विश्रमेवमेतदुदौरितम्। भतःपरं स्वनामेव तन्त्रमुत्तरमुच्यते॥

Suśruta Samhitā, I. iii.

² वीज चिकित्सितमैत्रतत् समासेन प्रकीर्त्ततम् । स्विश्रमध्यायशतमस्य व्याखा भविष्यति ॥

तच सविधमध्यायधतं षञ्चसु स्थानेषु। तव सूचस्थाननिदानधारीरिचिकित्सितकर्पे-ष्वर्धवधात संविभन्धोत्तरे तन्त्रे प्रेषानर्थान् व्याखायासानः।

Ibid, I. i.

अविश्रमध्यायश्रतमेतदुत्तं विभागशः।
इही द्विष्टानि निर्देशन्य क्वान् वद्यास्ययोत्तरे॥
सनातनला देदानामचर लात्तयेव च॥
तथा दृष्टम जलाव चितलादि पि दिहिनां।
वात्त् समूहा थेविसारात् पूजितला च दिहिनाः॥
चिति सितात्पुर्यातमं न कि विदिष सुनुत।
ऋषेरिन्द्रप्रभावसा स्तरी निर्भिष गुरीः॥
धारियला तु विमलं मतम् परमस्मतं।
छताहार समाचार्यं ह प्रेल्य च मोदते॥

.. Ibid, V. viii. ...

प्रागाभिष्ठितं सविधमध्यायमतं पञ्चसु स्थानेषु । तच स्वस्थानमध्यायाः षठ्चलारिमत् । षीड्म निदानानि । दम मारीराणि । चलारिमचिकित्सितानि । अधी कल्पाः । तदुत्तरं षठ्षष्ठः ।

that at the end of no other sections do we find a similar He also writes: "Thus one hundred and twenty chapters are described" but adds: "The other diseases shall be described in the Uttara Tantra": the latter part no doubt is an interpolation of the Supplementor. Moreover, in the opening lines which serve as a preface to the sixth part, the authority quoted for the diseases of the eye is Nimi, the king Janaka of Mithila and not Dhanvantari. But in the first chapter of the first section, it is described that the sages wanted Dhanvantari. to teach them Salyatantra or Major Surgery only and he consented to their request. And this subject he treated in detail in the five sections of the book. In the Supplement, on the other hand, are described the other branches of the science such as Minor Surgery, Inner Medicine, &c. Probably this part was added afterwards to give completeness to the treatise; and the original Suśruta was called Vrddhya or the Old by the commentators to distinguish him from the Supplementor.

Susruta's work is specially important to us as having two whole chapters (vii and viii of Section I.) devoted to the descriptions of Surgical Instruments and one whole chapter (xxv of Section I.) to the principles of Surgical Operations.

The age of Susruta is also involved in obscurity. Nothing can be ascertained from the fact that he was a son of Visvāmitra",

भव्यायानां भते विशे यदुक्तमस्क्षन्तया। वच्यामि वड्डधा सम्यगुक्तरेऽर्थानिमानिति॥ इदानीन्तत् प्रवच्यामि तन्तमुक्तरमुक्तमः। निखिलेनीपदिश्चन्ते यत्र रोगाः पृथग्विधाः॥ भाषाक्षश्रास्त्राभिष्ठिता विदेहाधिपनौर्तिताः॥

Suśruta Samhita, VI. i.

<sup>&</sup>lt;sup>2</sup> Viśvāmitra is the gotra name; so the simple name may either refer to \*the great Viśvāmitra or to his descendants.

for the age in which the latter lived is not known to us. But he must have flourished during the Vedic Age as many Vedic Hymns are ascribed to him. In the Mahābhārata, Suśruta is mentioned as one of the sons of Viśvāmitra and in the Sušruta Samhita the author is often described as his son. The age of the great epic has, with good reasons, been fixed at 1000 B.C. So Susruta must have flourished much earlier. The latest limit which we can assign to Susruta is 600 B.C. as "there are indications in the Śatapatha Brāhmana, a secondary Vedic work, that the author of it was acquainted with the doctrines of Suśruta" as regards the Osteology. "The exact date of that work is not known, but it is with good reason referred to the sixth century B.C." Again in the Atharva Veda, in the tenth book, there is a hymn on the creation of man in which the skeleton is described according to Atreya and Suśruta.<sup>2</sup> "The large portion of it (Books I to XVIII) indeed admittedly belongs to a much earlier period, possibly as early as about 1000 B.C.; and the hymn in question is included in this older portion"8. This shows that Susruta could not have flourished later than 1000 B.C.

Again in Hasti-Ayurveda, a book on the Treatment of

म्यामायनीऽथ गार्ग्यं आवितसुमुतस्तया—

विश्वामिताताजाः सर्वे मृनयी ब्रह्मवादिनः ॥

Mahābhārata, Anuśaşana Parva, Ch. IV.

<sup>&</sup>lt;sup>2</sup> See J. R. A. S., 1906, P. 915; 1907, P. 1.

<sup>\*</sup> Hoernle's Studies in the Medicine of Ancient India, Part I. Osteology, Introduction, P. 9.

Elephants by Pālakāpya, we find the Surgical instruments described after the manner of Susruta. Pālakāpya lived as a Veterinary Surgeon in the Court of Romapāda, King of Anga, which had as its capital the famous town of Campā, identified with the modern town of Bhāgalpur. King Romapāda was contemporary with king Daśaratha, the father of Rāma, the hero of Rāmāyana. Here we have a corroborative evidence of the age of Suśruta.

Susruta is mentioned in the Vārttikas of Kātyāyana<sup>2</sup> who flourished during the fourth century B.C.

We have alluded to Nāgārjjūna, the Buddhist Chemist, as the redactor of the Suśruta Samhitā. He is said to have been a contemporary of king Kaniska that is about the first century B.C.

Another revision was undertaken by Candrate, the son of Tisata, the author of Cikitsā-kalikā. He revised the text which must have fallen then into a state of corruption. The probable date of Candrate is the ninth century A.D.<sup>4</sup>

# भिन्न अपि ग्रमुषमाणसा पितरं च यश्चिनम्। एतक्किक्विकाले तुरीमपाद प्रतापवान।

Rāmāyana, Vālakāndam, Ch. IX.

See also Rāmāyana, i, 11, 13-20; Mahābhārat, iii, 110, 10008-9; Bhāgavat, 3x, 23, 7-10.

# <sup>2</sup> सुत्रुतेन प्रीतं सीत्रुतं।

.3 Possibly more than one Nāgārjjūna appeared in ancient India as a chemist. Albērūnī says: "He lived nearly a hundred years before our time" (India, I. P. 189). Rājtaraūginī places him in the 3rd century B.C. (I. Vs. 172-173). The modern scholars are of opinion that the founder of the Mahā-yāna system lived in the first century A.D.

Hoernle's Osteology, p. 100.

There is no doubt of the tradition that Susruta's work was redacted, for the author could not write such a passage as follows: "The surgical treatises of Aupadhenava, Aurabhra, Susruta and Pouskalāvata from the basis of other treatises on the subject." Commentators.2—

- 1. Cakrapānidatta—Vānumati—1060 A.D.
- 2. Gayadāsa  $\begin{cases} Nyāya \ Candrik\bar{a} \\ or \ Panjik\bar{a} \end{cases}$  —11th century A.D.
- 3. Jejjaţācāryya.
- 4. Bhāskara.
- 5. Mādhava.
- 6. Bramhadeva.
- 7. Dallanācāryya—Nibandha Samgraha—12th century A.D.
- Ubhalta (Kashmir).

Editions.—Suśruta Samhitā has been edited by Madhusūdan Gupta, Calcutta, 1835; by J. Vidyāsāgar, 3rd Edition, Calcutta, 1889; by A. C. Kaviratna, Calcutta, 1888-95; by Prubhurām Jībanarām, Bombay, 1901; and by Vīrasvāmī, Madras.

This book has been translated into English in part only by U. C. Datta 1883, A. Chattopadhyay 1891, Hoernle 1897, Calcutta, in the Bibliotheca Indica. It has been translated into Latin by Hessler and into German by Vullurs.

The book was translated into Arabic before the end of the eighth century A.D. It is called "Kitab-Shawshoon-al-Hindi"

# चौपधनवनीरभं सीयुत पीष्त्रखावतम्। श्रेषायां श्रद्धातनायां मुलाग्येतानि निर्द्धित्॥

Suśruta Samhitā, I. iv.

\* \* \* दे योसहनपालदेवष्टपतिवक्षभः योजक्षणः समभ्त्। तेन योजिन्भटं टीकाकारं योगयदासभास्त्ररी च पश्चिकाकारी योमाधवनद्वा-देवादीन् टीप्पनककारायीपजीव्यायुर्वेदमास्त्र सुयुतव्याख्यानाय निवन्ससंग्रष्टः नियते। Dallana's Commentary, I, i. and also mentioned as "Kitab-i-Susrud" or Book Susruta by Ilin Abillsaibial. Rhazes often quotes Sarad as an authority in Surgery.

# VĀGBHATA I.

The next author of celebrity and whose work is still extant is Vāgbhaṭa I or Vāgbhaṭa the elder, the author of Aṣṭāṅga Saṃgraha (i.e., Compilation of the Octopartrite Science). In later times, a namesake of his, wrote another work called Aṣṭāṅga Hṛdaya Saṃhitā (or the best Compendium i.e., the Heart of the Octopartrite Science). In the Uttara Sthāma. Vāgbhaṭa the younger distinctly states that his Compendium is based on the Compilation of Vāgbhaṭa the elder.

As regards the age of Vägbhata the elder, there is the same uncertainty as with his predecessors. We are however sure that he is posterior to Caraka and Suśruta for he refers to these writers by name.<sup>3</sup>

The chronological relation of the three early authors is described in a popular couplet that Ātreya, Susruta and Vāgbhata were the three great medical authors for the three Yugas—

Adam's Commentary on Paulus Æginetta, VI. lxi.

ष्रष्टाङ्कवैदाक्षमङ्गीदिधमस्यनेन यीऽष्टाङ्कसंग्रहमङ्गस्तराश्चिराप्त । तस्मादनत्यपालमत्यससुदामाणां प्रीतर्यमेतदुदितं पृथगेव तन्त्रम् ॥

Aştanga Hrdaya Samhita, Uttara Sthana, Ch. NL, v. 82.

i "His next description is from an author named Sarad, whom he frequently quotes in other parts of his works".

<sup>&</sup>lt;sup>3</sup> By name, e.g. in Samgraha, Bombay ed., Vol. I, P. 246; Vol. II, P. 421. Again quoted from Caraka, *Ibid.*, Vol. I, pp. 20, 93; Vol. II, pp. 212, 213, et passim; from Susruta I, *ibid*, Vol. I. pp. 109, 121, 177, 247; Vol. II, p. 343, et passim. (Hoernle).

the Tretā, Dvāpara and Kali, respectively. They are known as the Vrddha Travi or the Old Triad. This medical tradition goes much against the conclusion of Dr. Hoernle that Vagbhata I must have flourished early in the seventh century A.D. One of the reasons put forward by him is the fact, that "the Buddhist pilgrim I'Tsing, who resided ten years in the Nalanda University (in Bihar) from about 675-686 A.D., states in Records of Buddhist practices that the eight arts (i.e., the branches of medicine) formerly existed in eight books but lately a man epitomised them and made them on one bundle (or book)."2. Professor Jolly understands by it the Susruta Samhitā while Dr. Hoernle points out with more reasons that it refers to Vāgbhaṭa I's work, the Aṣṭānga Samgraha (i.e., the Compilation of the Octopartrite Science) and rules out Susruta by the word "lately." 3 But the description that I'Tsing gives of the contents of the book does not warrant any either. reference to Moreover, he has not given any reason why Vāgbhaṭa II's book Aṣṭānga Hṛdaya Samhitā (the best Compendium of the Octopartrite Science) might not be alluded to by I'Tsing. Dr. Hoernle, however, rules him out by date for "he can not be placed earlier than the eightth century"—an assertion unsupported by any evidence whatsoever. All that he has proved is that "Accordingly it is probable that all these three medical writers (Mādhava, Dṛḍhatala and Vagbhata II) come in the period from the 7th to the

<sup>&</sup>lt;sup>1</sup> See foot-note 3, P. 6.

<sup>&</sup>lt;sup>2</sup> I'Tsing: Records of the Buddhist Religion. Transl. by Professor Takakusu, P. 128.

<sup>&</sup>lt;sup>3</sup> J. R. A. S., 1907, P. 413.

Hoernle's Osteology, Introduction, P. 10-11.

9th century A.D. 1 at no very great interval from one another," and this proof is based on the age of Vagbhata I as suggested by I'Tsing's remarks. Thus he has taken for granted what he is required to prove. He has shown that Susrata is anterior to Vāgbhata I; and Vāgbhata II is posterier to him. But in trying to prove that Vagbhata I lived in the seventh century he cannot assume that Vagbhata II lived in the eighth., Another evidence adduced in support of his conclusion is the fact that the non-medical version of the list of bones of the human body as contained in the Law-book of Yajnavalkya, presupposes earlier uncorrupted forms of lists of bones both in Caraka and Susruta, and "the corrupt recension, traditionally handed down, must have come into existence at a later date." that is to say, between the date of Yājñavalkya (350 A.D.) and Vagbhata I, the latter of whom is proved to have copied from the corrupt recensions of Caraka and Susruta. Thus the older recensions still existed in the fourth century A.D. and if we add to it the interval of time necessary for the texts to have fallen into a state of corruption, we get the early seventh century A.D. for Vagbhata I. But we must remember that there is nothing to prevent against the supposition that Vagbhata I lived before Yājñavalkya. There might have been two recensions of the texts available during Yājñavalkya's time, one corrupted and it might or might not have been the work of Vagbhata I and another true version which was availed of by the sage Yajñavalkya. And similar events have happened, as has been pointed out by Dr. Hoernle himself, in our own generation. Gangādhar's recension of Caraka is a corrupted form of the text,

<sup>1</sup> Ibid, P. 16.

while the recension given in Jibānanda's edition is the traditional text of Caraka. No critic would I think jump into the conclusion that Gangādhar lived three or four centuries after Jībānanda. • Again if it be true, as he contends, that Suśruta was redacted by Vāgbhaṭa I, we could easily imagine that Yājñavalkya copied his list bones from the original Suśruta and not from the redaction of Vāgbhaṭa I. So we see that the age assigned to Vāgbhaṭa I, or the seventh century A.D. can not be accepted as proved. Dr. Hoernle says: "It should, however, be understood that these conclusions regarding the date and authorship of Vāgbhaṭa I, are not put forward as established fact."

Let us recapitulate the objections that can be urged against the conclusion that Vagbhata I lived in the seventh century. A.D.

- 1. Vāgbhaṭa I is believed by the Indian medical men to have flourished long before the Christian era. By some, he is connected with the court of Yudhisthira, but his name is nowhere mentioned in the Mahābhāraṭa. Ātreya, Suśruṭa and Vāgbhaṭa are described as the Old Triad or Vṛddhya Trayī and they were the authorities for the Tretā, Dvāpara and Kali Yugas, respectively. It is curious to observe that Dr. Hoernle in arguing against the conclusion of Prof. Jolly that Suśruṭa is meant by I'Tsing, takes advantage of this Indian medical tradition that Suśruṭa flourished during pre-historic times, but does not mention the same tradition with regard to Vāgbhaṭa I, which goes against his own conclusion. On the other hand the same objection does not apply against Vāgbhaṭa II.
  - 2. The name of Vagbhata. I's book, Compendium of the

Octopartrite Science, no doubt, agrees very well with the description of I'Tsing that "lately a man collected them into one bundle." But Vāgbhaṭa II's book "The best Compendium of the Octopartrite Science" is equally suggestive, though Dr. Hoernle says: "it cannot prevail by the side of the more suggestive name of the rival work of Vāgbhaṭa the elder."

- Again in arguing against Prof. Jolly, Dr. Hoernle has attached much importance to the word "lately" by which Susruta is ruled out by date. Admitting the validity of such reasoning, it does not follow that by the word "lately" I'Tsing meant any contemporary author or any one who preceded him by a short period only. To comprehend the meaning of the sentence we must understand the word "lately" in connection with the word "formerly" used before. 1 Now the sentence "The science of medicine formerly existed in eight books" no doubt refers to the division of Ayurveda into eight parts by Brahma and to the treatises on the different branches of Medicine by Agnivesa, Susruta and others. These treatises are believed to be of remote antiquity, and so any later compilation may be spoken of as recent in comparision with the old treatises of unknown ages. Thus the word "lately" may refer either to Vagbhata I or Vagbhata II, but the latter author's claim to the honour becomes reasonable considering his decided posteriority to the former and so coming within the limit of the time suggested by the word "lately."
- 4. Again I'Tsing refers to a book which was recognised as the standard throughout India. This may refer either to

<sup>&</sup>lt;sup>1</sup> J. R. A. S. 1907. P. 174.

Vāgbhaṭa I or II. But if Vāgbhaṭa I's book occupied such a position at the time of I'Tsing, it becomes difficult to imagine why Vāgbhaṭa II should write another work principally based on the work of Vāgbhaṭa I after a lapse of a century or so. Moreover, we find at the present time, that Vāgbhaṭa II's book, Aṣṭānga Hṛdaya Samhitā, has a wider popularity than the book Astānga Samgraha of Vāgbhaṭa I. The former has been printed many times and is widely read by the students,—so much so Vāgbhaṭa is generally known as the author of Aṣṭānga Hṛdaya Samhitā.

- 5. Moreover, the Arabian physician Rhazes, who is said to have lived in the ninth century (882 A.D.) in treating of the property of ginger, the common plantain or musa and other drugs, quotes from an Indian writer, whom he calls Sindaxar or Sindicara. Royle says: "But in the article De Allio another Indian author is quoted, whom I have not been able yet to trace out—Ait Sindifar (in another place written "Dixit sindichar") indianus valet contra Ventositatem." This Sindicara is identified with Vāgbhaṭa II of Sindh who was in his time known as a second Caraka or Cara, the syllable "ka" making no difference, as in words like "bāla" and "bālaka," both meaning a child. We know that the Vāgbhaṭa's Aṣṭāṅga Hṛdaya Samhitā was one of the medical works translated by the order of Caliphs in the eighth century.
- 6. The translations of the Caraka, the Susruta and the Vagbhata occur in the Thibetan Tanjur.<sup>4</sup> "George Huth,<sup>5</sup>

<sup>&</sup>lt;sup>1</sup> Antiquity of Hindu Medicine, Page 38.

<sup>&</sup>lt;sup>2</sup> History of Aryan Medical Science, P. 196.

<sup>&</sup>lt;sup>3</sup> Zeit. deut. morg. Ges. 34, p. 465.

<sup>4</sup> Jour. Asiatic Soc. XXXVIII. (1835).

<sup>&</sup>lt;sup>5</sup> Zeit. deut. morg. Ges. T. (LXIX. pp. 279—284).

who has recently critically examined the contents of the Tanjur, concludes that the most recent date at which it can be placed is the 8th century A.D."<sup>1</sup>

So I cannot avoid the conclusion that of the three authors, Susruta, Vagbhata I and II, to which I'Tsing's remarks may refer, the last has probably the best claims to that reference; and the date assigned to Vagbhata I may well suit Vagbhata II i.e., "as late as the early 7th century A.D.," and possibly still earlier. Again it is impossible for us to say whether I'Tsing's remarks may not appropriately refer to other authors whose works are lost to us.

Mention should also be made of the fact pointed out by Dr. Cordier that Vāgbhaṭa is mentioned in Rājtaraṅgiṇī and his date is fixed there as 1196-1218 A.D.<sup>4</sup>

But the name of Vagbhata does not occur in Stein's edition of Raj, which is no doubt the most reliable, and so we can easily dismiss this view as untenable.

Editions.—Vāgbhaṭa I's book Aṣṭāṅga Saṃgraha has been printed in Bombay.

Commentary.—Arunadatta—about 1220 A.D.

Quoted in Cordier's Vāgʻbhata et L'Astangahrdaya Samhitā, 1896.

See Intro. to the Vaidyakśabdasindhu by Kavirāja Umešcandra Gupta, 1894.

P. C. Ray's History of Hindu Chemistry, Intro., P. XXIX.

<sup>&</sup>lt;sup>2</sup> Hoernle's Osteology, Intro., p. 10.

Dr. Kunte places him "at least as early as the second century before Christ," Vide his Intro. to Vagbhata's Astanga Hrdaya Samhita.

<sup>4</sup> सिंहगृतसुतः प्रमनौद्धी वागभटाचार्थः कारमीर्नग्रपति ज्यसिंहस्य प्रजापालन समये (खृः हादश अकाल्याम्, शक ११६८—४०) वर्त्तमाना चासीत्।

### VĀGBHATA II.

The next great authority in Hindu medicine is Vāgbhaṭa II, son of Simha Gupta, an inhabitant of Sindh.¹ His work, Aṣṭāṅga Hṛdaya Samhitā, the author himself states, is based on the summary of Vāgbhaṭa the elder.² In the first chapter of Sūtra Sthāna, he acknowledges the help he received from the works of Agniveśa, Hārīta, Bhela, and others.³ The fact that Caraka is not referred to here as one of the sources of Vāgbhaṭa II has been taken advantage of by some to prove the posteriority of Caraka.⁴ They conclude that Agniveśa and Suśruta wrote their works long before him, and the Agniveśa Tantra was not called by the name of, and in fact was not as yet edited by, Caraka, at the

भिषग्वरी वाभट इत्यभुनमें पितामही नामधरीऽखि यस्य सुतीऽभवत्तस्य च सिंहगुप्तः तस्याप्यहम् सिन्धुस् जातजन्मा ॥

Aşţānga.

- <sup>2</sup> Aşţānga Hrdaya Samhitā, Uttara Sthāna, Ch. XL, v. 82. See foot note 2, p. 18.
- अन्ना स्टलाऽऽयुषी वेदं प्रजापितमिजग्रहत्। सीऽधिवनी ती सम्म्याचं सीऽचिप्रवादिकान्मुनीन्॥॥॥ तेऽग्निवेशादिकांस्ते तु पृथक् तन्नाणि तेनिरे। तेस्वीऽतिविप्रकीर्णैभ्यः प्रायः सारतरीचयः। क्रियतेऽष्टाञ्चन्नदर्यं नातिसेचीपविस्तरम्॥॥॥

Aştanga Hrdaya, Sütra Sthana, Ch. 1.

"It would appear also that at the time Vagbhata lived, Agnivesha's work was not called by the name of Caraka, and Susruta had also been written. Hence it follows that Caraka's edition of Agnivesa, that is the work now called Caraka, was probably edited after Susruta had been written."

time Vagbhata II flourished. The argument is however not conclusive; it only shows that the Agnivesa Tantra was available to Vagbhata II in its original form. No definite results can be expected from this argumentum ex silentio. Again it may easily be imagined, and I think it is the right view of the question, that Caraka lived and edited Agnivesa's work long before Vagbhața, the reason of Caraka being not mentioned in Vagbhata's book, is the fact that Caraka did not usurp the authorship of Agnivesa Tantra but clearly states at the end of each chapter the real nature of his share in the authorship of his book in the following words:- "Here ends the chapter of Agnivesa Tantra as corrected and edited by Caraka." Many modern text books of medicine have been edited and improved, though the books are still called after the original authors. Moreover to make Caraka flourish after Vagbhața II would bring him to quite modern times.

We are however arguing on false premises. Though Caraka is not mentioned in the Sūtra Sthāna of Aṣṭāṅga Hṛdaya, his name occurs in the Uttara Sthāna. So there can be no doubt that Caraka's edition of Agniveśa was current in India long before Vāgbhaṭa II wrote his Aṣṭāṅga Hṛdaya Saṃhitā.

Editions.—There are various editions of the book but the following are reliable:—

- By Dr. Anna Moresvara Kunte, M.D., 2 vols., Bombay, 1880; 2nd Ed., 1891.
- By Jībānanda Vidyāsāgara, Calcutta, 1882.
- 3. By Vijayratna Sen Kaviranjana, Calcutta, 1885-90.
- 4. By Ganes Sastri Tartevaidya, Bombay, 1888.
- In Sanskrit and Bengali, with the commentary of Arūnadatta by Vijayratna Sen Gupta, Calcutta, 1888.
- In Sanskrit and Guzrathi by Behicharlal Nathuram, Ahmedabad, 1889.
- In Sanskrit and Bengali by Kāliśa Cundra Sen Gupta, Calcutta, 1890-1892.
- In Sanskrit and Hindi by Pandit Robi Dutta, Bombay, 1890.
- In Sanskrit and Marathi by Ganes Kṛṣṇa Garde, Poona, 1891.
- In Sanskrit and Bengali by Kavirāja Binod Lāl Sen, Calcutta, 1891-1892.

### Commentaries.1—

 Sarvānga Sundarī<sup>2</sup> by Arūnadatta, son of Mṛgānkadatta, 1220 A.D.

Colophon at the end of each Chapter of the Commentary.

<sup>&</sup>lt;sup>1</sup> See Cordier's Vāgbhaṭa et L'Aṣṭāṅgahṛdaya Saṁhitā, P. 6.

द्वित श्रीमृगांद्वरत्तपुत्त श्रीमदद्वणदत्तिविरायां सर्व्वाद्वसन्दराख्यटीकायां \* \* \* \* \*

- Āyurvedadarsayana (Dinacharya Prakarana) by Hemadri or Kamadeva, Raja of Devagiri. It is available in parts only.
- 3. Aştangahrdayarddyota by Asadhara Sallaxana.
- 4. Padarthacandrika by Candracandana.
- 5. Sanketamañjarī by Dāmodara.
- 6. Astanga Hrdayatika by Ramanath Vaidya.
- 7. Vālaprobodhikā (Anonymous).
- 8. Hrdayabodhikā
- 9. Pāthya.
- 10. Vāgbhatartha Kaumudī by Hari Kṛṣṇa Sen Mullick.
- 11. Pradīpa by Jaśodānandan Sarkār, 1298 B.S.

### VĀGBHATA III.

The author of Rasaratna Samuccaya in the Colophons at the end of each chapter identifies himself with Vāgbhaṭa II: "Here ends Book first (or so) of R.R.S. composed by Vāgbhaṭa, son of Simha Gupta, prince of physician." The salutation at the beginning of his book is strictly Buddhistic. The probable date of the book is "placed between the thirteenth and fourteenth centuries A.D." "The chemical knowledge, as revealed in Vāgbhaṭa is almost on a par with that in the Suśruta," whereas the R.R.S. indicates an advanced state of that science. He quotes Rasārṇava as a source of his information; he does not mention opium as a medicine, and the Firanga roga and its treatment find no place in his book.

<sup>&</sup>lt;sup>1</sup> P. C. Rāy's History of Hindu Chemistry, Intro., p. li.

### MĀDHAVAKARA.

He is the author of the famous work on Pathology or Nidana. His book was translated into Arabic by the order of Harun-Al-Rasid and so the most recent date that can be assigned to him is the seventh century A.D.<sup>1</sup> Thakore Saheb of Gondal identifies him with Madhabacaryya, the celebrated author of Sarvadarsana Samgraha, the brother of Sayana, the commentator of the Vedas.<sup>2</sup> I do not find any authority for such an assertion and here is an example of fallacious reasoning based simply on the identity of names. Madhabacarvya and Sayana lived in the twelfth century A.D. Mention should also be made of the view expressed by Dr. Hoernle as certain that Madhavakara, the author of Nidana and Vrnda Madhaba, the author of Siddhayoga are one and the same person. He holds that Vrnda is the real name, but he was known to the commentators as Madhava; for his melodious diction. There is no proof given of this opinion, and we have reasons for not accepting it. However as he does not treat of surgical instruments, his work is not important to us.

# CAKRAPĂNIDATTA.

Cakrapāṇidatta or more commonly Cakradatta in a Colophon<sup>3</sup> has given an account of himself in his book called

<sup>&</sup>lt;sup>1</sup> Jolly's Indian Medicine, ff. 5, 6, pp. 7-9.

<sup>&</sup>lt;sup>2</sup> History of Aryan Medical Science, Ch. II, p. 35.

गौड़ाधिनाथ रसवत्थाधिकारिपाच—
नारायणस्य तनयः सुनयोऽन्तरङ्गात् ।
भानीरनु प्रथितचीभ्रवचीकुचीनः
श्रीचक्रपाणिरिष्ठ कर्मृंपदाधिकारी॥

Colophon in Cakradatta,

2 -

Cikitsā Sāra Samgraha: "The author of this work is Śrī Cakrapāṇi who belongs to the family of Lodhravalī; and who is the youngest brother of Vānu and the son of Nārāyaṇa, the superintendent of the kitchen of Nayapāla,¹ the king of Gour." This book is arranged on the plan of Vṛnda in his Siddhayoga² which again follows closely as a companion volume to Mādhava's Nidāna.³ The age of Cakradatta is about 1060 A.D.; and Vṛnda must have flourished between Mādhava and Cakrapāṇi for he quotes the former while he is himself quoted by the latter. So the probable age of Vṛnda is the ninth century A.D. Besides being a celebrated author, Cakradatta wrote excellent commentaries of Caraka and Susruta. His extant works are—

 Cikitsā Sāra Samgraha or Cakradatta. A treatise on Medicine.

यः सिड्योगिलिखिताधिकसिड्योगा— नत्नेव निचित्रति केवलसुद्धरेहा। भद्भचयिपथवेदविदा जनेन दत्तः पतेत् सपदि सुर्केन तस्य शापः॥

Sloka at the end of the Cakradatta.

य इत्यादी। — सिंडियोग इति वन्दलतसंग्रहस्य संज्ञा, तिल्लियोगसमेन्द्याधिका वै च चिहियोगा चन संग्रहे चल्लालानधिकयोगान् तनेव सिंडियोगे निचिपति, तथा यो वा तानधिक सिंडियोगानित: संग्रहादु इरेत् दूरी लुथात्, तस्य मूर्डनि ई ट्येन पुंचा दत्त: आप: पतित्। कीट्येन पंचा १ भड़नयनिपयनेदिविद्या। कारिका वृद्धीका चन्द्र टीकिति भड़ चर्यं, निपयनेद: सग्यनु:सामकप:, तिहदा॥

Śibadāsa Sen's Commentary.

Vrnda's Siddhayoga.

<sup>&</sup>lt;sup>1</sup> For the date of Nayapāla, vide Cunningham's Archœo. Survey of India. III. P. 119; also J. A. S. LX. Pt. I. P. 46. Life of Atisa by S. C. Dās.

<sup>े</sup> हन्देन \* \* \* \* \* \* संजिख्यते गदविनिश्वयक्रमेन ॥

- 2. Cakradatta or Materia Medica. It treats on drugs applicable to a number of deseases.
- Muktābali. This treatise on the nature and properties of medicinal drugs is ascribed to Cakrapāņi.
- 4. Vanimati-Commentary on Susruta Sainhitā.
- 5. Cakratattwadipikā-Commentary on Caraka Samhitā.

#### Editions .-

- Cakradatta or Cikitsā Sāra Saingraha edited by Kavirāja Pyāri Mohan Sen Gupta, Calcutta, 1295 B.S.
- Cakradatta with Bengali translation by Candrakumār Dās Kavibhuşan.
- Cakradatta with Bengali translation and with commentary of Siva Das Sen, by Jasoda Nandan Sarkar, 1302 B.S.

# SĀRANGADHARA.

He wrote Sărangadhara Sangraha. It is compiled from the works of Caraka, Suśruta, Vägbhaţa and others.<sup>1</sup> It is very popular in Western India. It treats on nosology and practice of Medicine. He was the son of Dāmodara and flourished in the fifteenth century A.D.

Edition.—By Kacirāja Pyāri Mohan Sen Gupta, Calcutta, 1296 B.S.

श्रीवद्यवीया सुनितिः प्रयुक्ता विवित्त्यके वे वदकीऽत्रमृताः । विवीवते आप्तं वरेच नेवां सर्वयकः सम्बन्धसम्बन्धः ॥ Commentary.—Sarangadharatīkā: It is a commentary on the above work by Adhamulla.

### BHĀVA MIŚRA.

About 350 years ago, a compilation was made by Bhāva Miśra, son of Lataka Miśra, an inhabitant of Benares, from the most celebrated medical works and was called Bhāva Prakāśa. He lived about 1550 A.D. and was considered a "Jewel of Physicians and Master of Śāstras." He mentions China root called Tob Chini² in the Vernacular as a remedy of Firanga roga or Syphilis³ which he describes for the first time in India. He was the first to make mention of certain drugs of foreign countries as Badhkshani Naspasi,

भागुर्व्वोदाध्यमध्यादतिमतिमुनयी योगरतानि यता-स्नुष्या से से निवन्धेदधुरस्तिन्जन व्यधिविश्वंसनाय। तत्तद ग्रन्यादग्रहोतै: सुवचनमणिभि भौविमियशिकित्सा भास्त्रे जाड्यात्यकारं प्रश्रमयितुमिनं सम्बिधते प्रकाशम्॥ Bhāva Prakāsa, I. i.

इति श्रीमिश्र लटकतनय श्रीमन्त्रिश्रभावनिरचिते भानप्रकाशे षष्ठ प्रकर्णं सम्पूर्णे ॥

Colophon at the end of Section I.

दीपान् रवचा किञ्चितिक्तीणा विद्वदीप्तिवत् । विवन्धासानग्रलेष्ट्री शक्तन्यूचिवशीधिनी ॥ वातव्याधीनपस्मारसुन्यादं तनुवेदनाम् । व्यपीऽति विशेषेण फिर क्षामयनाशिनी ॥

Bhāva Prakāsa, I. i.

फिरङ्गसंज्ञके देशे वाहुल्खेनव धङ्गवैत्। तस्मात फिरङ्ग इत्युक्ती व्याधिव्याधिविश्यारदै:॥

Bhāva Prakāša, II. iv.

Khorasani and Parasika Vacha (Acorus Calamus), Sulemani Kharjura (date fruit of Suleman), and opium.

#### Editions.

- 1. By Jībānanda Vidyāsāgara, Calcutta, 1875.
- 2. By Rasik Lal Gupta.
- 3. By Kālīśa Candra Vidyāratna.

Besides these books, the number of Sanskrit medical works is simply legion; many of them are daubed with fancy names and are excellent treatises on the different branches of medical science. But they are quite foreign to our purpose. I intend to publish in a separate volume short notices of the medical authors and their works, and so we need not dwell on them here.

पारसीक यवानी तु यवानी सद्दशी गुर्णै:। विश्रेषात् पाचनी कच्या गाहिणी मादिनी गुरु:॥

Bhāva Prakāśa, I.

पारसीकवचा ग्रक्ता प्रीक्ता हैमवतीति सा । हैमवत्युदिता तददातं हन्ति विश्रेषत:॥

Ibid.

उत्तं खसपलचीरमापूकमहिपेणकम्।

Ibid.

चीनाक सज्ञः कपूरः कपाचयकरः सृतः।

Ibid.

खर्ज्दी गीसनाकारा परहीपादिहागता॥

Ibid.

## CHAPTER II.

#### HOSPITALS AND DISPENSARIES.

Before entering into our proper subject, it would not be amiss to notice here two objects—Hospitals and Anæsthetics—which are essentially necessary for the devolopment of surgical knowledge. We know from the Edict II of Asoka that India during his reign was studded with hospitals not only for the treatment of human beings but also for the brute creations. But even before Asoka, hospitals flourished in India. In Caraka we can trace the germ of such an institution though it was used for rich men and did not accommodate the public.

ततः श्रीलशीचातुरागदा त्यप्रादि चिष्णीपपन्नातुपचारक्षश्रलान् सर्व्यक्षभंसु पर्यवदातान् स्पीदनपाचकसापकसंवाहकीत्यापकसंविश्वकीषघेषकां स्पित्तान् सर्व्यक्षभंस्प्रप्रितक्षलान्। तथा गीतवादिनीक्षापकसंविश्वकाषायां त्यायितित्वास-पुराणकुश्रलानाभिप्राय-न्नानतु-मतां स्व देशकाविवदः परिषदां स्व। तथा लावकपिं ज्ञलश्रश्रहरिणैनकालपुच्छक स्वगाति त्यान्। गाच देशि श्रीतविहित त्याप्रप्रद्यान्। गाच देशि श्रीतविहित त्याप्रप्रद्यान्। जलपाचाचननीदकी क्षमणिकपिठरघट कुभी कुभकु खश्रपावद व्यक्षिपरीपचन स्थानचेल सूचकार्पाती — चौपन्यसम्बन्धारप्रतिय हाणि सुप्रयुक्ता तर्याच राम्प्रदिनि च श्यनासनादीनि चौपन्यसम्बन्धारप्रतिय हाणि सुप्रयुक्ता तर्याच राम्प्रदिना स्थापनात्र सम्प्रात्ति स्वपात्र स्वपात्य

धूमनेचं विसनेचचोत्तरविस्तिच। कुश्रहस्त तुलाच मानभाष्डच प्रतिलवसामज्जाह-फाणितलवर्णेन्यनीदत-मधुसुरासीवीरकतुषीदकमेरियमेदकदिधमष्डादिष्टि हान्मास्नमूचाणि च । स्वा श्रालिषष्टिकसुद्गमाषयवित्वकुलत्यवदरस्दीकापद्विकामयामलकविभीतकानि नाना-विचानि च स्नेहस्वीदापकरणानि द्रव्याणि तथ्रैवोर्डहरणानुलोमिकोभयभाञ्चि संग्रहनीयदीप-नीयपाचनीयोपश्रमनीयवासहराणि समाख्यातानि चौषधानि यद्याग्यदिष किञ्चिद्यापदः परिसंख्यायोपकरणं विद्यते यच प्रतिभीगाष्टं तत्तदुपक्रस्यत्॥

¹ दृढं निवातं प्रवातैकदेशं सुखप्रविचारमनुपत्यकं धूमातपरजसामनिभगमनीयमनिष्टानाञ्च शब्द-स्पर्श-रस-रूप-गत्मानां सीपानीदूमलमुषलवर्षः स्थानसानभूमिमहानसीपेतं बास्तुविद्या-कुश्रलः प्रश्रसं ग्रहमेव तावत् पूर्वमुपकलपयेत् ।

He advises us as follows:—The engineer is to erect a strong and spacious building, well-ventilated at one part, the other part being free from draughts. The scenery should be pleasing and one should feet happy to walk in it. It must not be behind any high building, nor exposed to the glare of the sun. be inaccessible to smoke and dust. There must not be anything injurious to our senses as regards sound, touch, taste, form and smell. There should be stairs, large wooden mortars and pestles; and there must be additional bare ground for the construction of The staff should consist of a privy, bath-room and kitchen. servants and companions. The servants should be good, virtuous, pure, fond, clever, generous, well trained in nursing, skillful in works, able to cook rice and curries well, competent to administer a bath, expert masseur<sup>1</sup>, trained in raising and moving a patient, dexterous in making or cleaning beds, practiced in the art of compounding medicines and willing workers not likely to show displeasure to any order. The companions should be good singers and musicians, fluent speakers, well-versed in distichs, ballads, tales, history and mythology, well-acquainted with the design of a patient's nods or signals, agreeable and should have knowledge of the season and the locality. The various kinds of animals

सूदव्यैक्षनकर्तारसल्पका व्ययकास्त्रया। प्रसाधका भीजनाध्य गात्रसंग्रहका अपि॥

<sup>&</sup>lt;sup>1</sup> From the accounts of Megasthenes, we learn that four attendants used to massage him (Candragupta) with ebony rollers during the time that he was engaged in disposing of cases. Such an attendant (samvāhaka) is a minor character in the Toy Cart or little Clay Cart, drama, transl. by Ryder, in Havard Oriental Series, Vol. IX, 1905—Smith's Early History of India, 2nd Ed., Page 122. Footnote. We also find in the Kāmandikya Nītisāra that the king is cautioned against shampooers who have the opportunity of poisioning him.

should always be kept in stock such as Lava (Perdix Chinensis), Kapiñjala (partridge), hares, sheep and the different kinds of deers, Ena (the black antilope) blacktailed deer, and Mṛgamātṛka. There should be a diary attached to the building. The cow should be good natured and healthy, and should yield profuse milk. The calves must be living. There should be stocked for them potable water and hay in a clean fold. In that building must be kept the following necessary articles:—

Water vessels, washing basins, tubs, jars, dishes, ghata, (small jars) kumbhī, kumbha (larger and smaller vessels), kundu (jug or pitcher), soraba (earthen basins), spoons or ladles, cooking utensils, churning rods, cloth, thread, cotton, wool, bedding and asana (seats). Near them should be placed drinking vessels of gold and spittoons. The bedding should consist of a broad carpet, bed-sheet, pillows, and a bedstead. There should be collected good furnitures for beds and seats; and also utensils and appliances for application of oleaginous medicines, heat, oil, ointment, bath and perfumeries, and for the acts of emesis, purgation, draining of the brain, injection into the rectum, defaecation and urination (i.e. Vastivantra, urinal, bed-pan &c.). The blunt and sharp instruments and their accessories, well-washed mullers and whetstones of different degrees of smoothness-polished, plain or roughshould be near at hand; the tubular instruments for fumigation, inhalation and injection into the rectum, urethra and vagina, should be available there; and the following articles are also to be stocked:-brushes and brooms, weighing scales and weights, ghee (melted butter), oil, fat, marrow, honey, molasses, salt, wood, water, spirituous liquor formed by steeping husked grains of barley in water, or by boiling together the husks of fried māskalāya

(pulse of Phaseolous Rox.), barley and water, spirituous liquor from the blossoms of Lythrum Fruticoscence with sugar, spirit distilled from the different sorts of grains, curdled milk, rice, gruel, whey, sour liquid produced from the aceteus fermentation of powdered paddy, and the various kinds of urines of animals. Different kinds of rice such as Sali (or that reaped in cold season) and Sasthika (or that grown in hot weather in low lands and reaped within sixty days of its sowing), Mudga (Phaseolus mungo), Māṣa (Phaseolus Rox.), Yava (Hordeum Vulgare), seasame (Seasamum Indicum), Kullatha (Dolichos Biflorus), plums (Zizyphus Jujube), raisins (Vitis Vinifera). Parusa (Grewia Asiatica), Abhayā (Chebulic Myrobolan), Āmlakī (Phyllanthus Emblica). Vibhītaka (Terminalia Bellerica) and other classes of medicaments, as oils, diaphoretics, sternutatories, cathartics, emetics, purgatives, astringents, stomachics, digestives, calmatives, carminatives and various other forms of medicines, are required for treatment. Besides these, there must be stored the antidotes to poisons caused by overdoses of medicines and other appliances likely to add to the patient's comfort.

To this may be compared the description of the Greek intrium, which is mentioned in the Hippocratic treatise, De Medicio. He directs that "it should be so constructed that neither the wind nor sun might prove offensive to the patient, and goes on to enumerate the various articles which it should contain, such as scalpels, lancets, cupping-instruments, trepans, raspatories, with bandages and medicines." <sup>1</sup>

Works of Hippocrates, Syd. Soc. Vol. II, page 470, Footnote.

Susruta gives us a list of appliances required in surgical operations:—

1. Blunt Instruments. 2. Sharp Instruments. 3. Potential Cautery. 4. Actual Cautery. 5. Salaka or rods. 6. Horns. 7. Leeches. 8. Hollow bottle gourd. 9. Jambav-oustha [a bougie of blackstone, the extremity of which is shaped like the fruit of the Jambul tree (Urginea Jambolana)]. 10. Cotton. 11. Pieces of cloth. 12. Thread. 13. Leaves. 14. Materials of bandaging. 15. Honey. 16. Ghee, or clarified butter, 17. Suet. 18. Milk. 19. Oils. 20. Tarpan.—flour of any perched grain or condensed milk etc. mixed with water to mitigate thirst. 21. Decoctions. 22. Liniments. 23.Plasters. 24. Fan. 25. Cold and hot water. 26. Iron pans, kalasi and other earthen vessels; beddings and seats. 27. Obedient, steady and strong servants.

The Lying-in-room.—Caraka says: "Before the ninth month of pregnancy, the lying-in-room should be constructed. The land should be cleaned of bones, gravels and potsherds. The ground selected should be of auspicious colour, taste and smell. The gate of the house should face towards the east or the north.<sup>2</sup> There must be a store of wood such as Vilva (Ægle

<sup>े</sup> स्तोऽनामतं कसं चिकीर्षता बैद्येन पूर्णमेनीपकव्ययितव्यानि तद्यया यन्त्रश्रस्त्रचाराग्निः प्रकाकाग्रङ्गजलौकालानुज्ञान्वनीष्ठिपचुषीतस्चपचपद्रमधूष्टतवसापयसेलतर्पनकषायलेपन कल्का-व्यजनश्रीतीणोदक कटाइदीनि पारकर्षाण्यस्य खिग्धाः स्थिरा बलवन्तः।

Suśruta Samhitā. I. v.

<sup>2 &</sup>quot;The best sort of ground should abound with milky trees, full of fruits and flowers; its boundary should be of a quadrangular form, level and smooth, with a sloping declivity towards the east producing a hard sound, with a stream running from left to right, of an agreeable doour, fertile, of an uniform

Marmelos), Tinduka (Diospyros Embryopteris), Inguda (Balanites Rox.) Bhallakaka (Semecarpus Anacardium), Varuna (Ocimum) Basilicum), Khadira (Acacia Catechu) or wood of other kinds said to be auspicious by a Brahman versed in the Atharvaveda; and there must be a sufficient provision for clothes, liniments, For the pregnant woman, be careful to have a and covers. fire-place, water, pestles and mortars, a privy, a bathing place, and ovens. These should be constructed according to the science of engineering and should be pleasant with regard to There should be collected clarified butter, oil, the season. honey, different kinds of salts as rock salt, sonchal salt, and treacle. Kustha black salt, Vidangas (Embelic Ribes), (Saussurea Lappa), Kilima (Pinus Deodara), Nagara (dried root of Zinziber Officinale), Pippalī (Piper Longum), its root, Hasti-(Scindaspus Officinalis), Mandukparni (Hydroctyle pippalī Elā (Elettarium Cardamomum), Lāngolī (Gloriosa Asiatica), Superba), Vāca (Acorus Calamus), Cavya (Piper Cava), Chitraka (Plumbago Zeylanicum), Chiravilva (Pongamia Glabra), Hingu (Ferrula Assafætida), Sarsapa (Mustard seeds), Lasuna (Allium Sativum), finely or thickly powdered rice, Kadamba (Anthocephalous Kadamba), Ātasi (Linum Usitatissimum), Vallija (Cucurbita Pepo), Bhurya (Betula Bhojpatra), Kulatha Dolichos Uniflorus), Maireya (a spirituous liquor from the blossoms of Lythrum Frutecoscence) and Ashava (Vinous fermented liquor from sugar or molasses, Rum). Also collect two pieces of

colour containing a great quantity of soil, producing water when dug to the height of a man's arm raised above his head, and situated in a climate of moderate temperature."

Manosara, Ch. I. quoted in Ram Raz's The Architecture of the Hindus,

stone (muller and stone slabs), two pestles, two mortars, an ass, a bullock, two sharp needles of gold and silver, two skeins of threads, sharp instruments of steel, two wooden bedsteads (Ægle Marmelos), and wood (Tinduka and Ingudi) for easily igniting fire. The female attendants should be mothers of children, and friends and relatives of the patients. They must be fond of her, skillful in work, intelligent, jolly, laborious full of tender love for the children and a favourite of the mother."

The Child's Room:—He continues—"The engineer is to construct a room, spacious, beautiful, full of light, well-ventilated but free from draughts, strong, and free from beasts of prey, animals with fangs, mice and insects. There should be kept water, mortar and seperate places should be assigned for bathing, cooking, urination and defectation. It should suit the season of the year. The beddings, seats and covers should be confortable and suitable to the season. Auspicious ceremonies should be performed in that room such as homa, expiations and presents to gods, for the proper protection of the child; and there should be present pious old men, doctors, and devoted

<sup>े</sup> प्राक्ष चेवासा नवमान्यासात् स्तिकागार कारयेदपहतास्थियकंराकपाखेदेश प्रयक्षकपरसग्धायां भूमी प्राग्हारसुदग्हारं वा। तन वेववानां काष्ठानां तिन्दुकेषुदानां सङ्कातकार्गा वाक्षानां खिद्रानां वा यानि चानान्यपि ब्राह्मणाः शंसेयुरधर्ववेदिवदसहस्रनालेपनाह्यादनापिधानसम्पद्रपेतं तत्। वास्तु-विद्या-इदययीगेनाग्निसिलिलीलुखलवर्षः स्थानसामभूमिसङ्गनस्रसुखंद्राः तन् सर्पसीलमध्रसेन्ध्रवसीवर्षाकालवणविष्कुण्युष्कुष्ठकिलिमनागरचिप्पलीमृल्इसिपिप्पलीमस्कून्ध्रयोखालाङ्कलीवचाचव्यचिचकचिर्विक्तः सुरः॥ व्यायमानी
ही हे चच्छमृष्के हे छलुखले खरी इष्ठमय हो च तीच्ची स्वीपिप्पलको सीवर्षराजती हे

प्रस्ताप च तीच्चायसानि ही च विक्वमयी पर्यको तैन्दकेषुदानि वाष्ठव्यप्रिसम्भुच्चानि
स्त्रियस वङ्गो वङ्गःप्रजाताः सीहाईयुक्ताः सतसमनुरक्ताः प्रदिचनाचाराः प्रतिपत्तिक्रम्लाः

प्रक्रातिवत्सलाव्यक्तविषादाः क्रेमसङ्खनीऽभिनता ब्राह्मण्यायाव्यविदिवदी यचान्यदिप तैच

समर्थं सन्वेत यस ब्राह्मनाः ब्रुष्टः स्त्रिय इङ्गासन्काथ्यम् ॥

Caraka Samhita. IV. गाः

attendants constantly. The child's bed, covers and sheets should be soft, light, pure and scented. These should always be free from sweat, dirt, worms or bugs, urine and fæces. If repeated change of new clothes be impossible, the soiled coverings should be well washed and the beddings well purified with steam and thoroughly dried before they are used again. To purify or sterilise the dress, beddings, coverings and sheets by fumigation use the following medicines with clarified butter:—Barley (Hordeum Vulgare), mustard seeds, linseeds, assafætida, Guggula (Balsamodendron Mukul), Vāca (Acorus Calamus), Coraka (Andropogon Acicularis), Vayasthā (Chebulic Myrobolan), Golomi (Panicum Dactylon), Jatila (Nardostachys Jatamansi), Palankasā (a variety of Guggula), Aśoka (Saraca Indica), Rohinī (Picrorrhiza Kurroa) and sankes' skin.....A variety of toys to please the child should be at hand and these should be coloured, light, musical, beautiful and must not be sharp pointed. They should be of such a size and shape as cannot be put into the childs' mouth or do not terrify or kill the child."1

¹ भतीऽनन्तरं कुमारागारविधिमनुव्याख्यास्यामः॥ वास्तुविद्याक्त्रग्रलः प्रथतं रम्युमतमस्तं निवातं प्रवातैकदेशं दृद्मपगतश्वापदपग्रदंष्ट्रमूषिकपतङ्गं सुसंविभक्तसिखलीदृखलमूचवर्षः-🛶 स्थानसानभूमिमहानसस्तुसुखं ययत् प्रयनासनासरणसम्पन्नं कुर्यात्। तथा सुनिहित-रचाविचानविज्ञमङ्गलहोनप्रायिच्यां ग्रचिव्वडवैद्यानुरक्तजनसम्पूर्णमिति । कुमारागारविधिः॥ श्यनासर्थप्रावर्णानि कुमारस्य चदुलघुश्वसिग्गन्धीनि स्य:। स्वेदमलजन्तुमन्ति मूचपूरी-षीपसृष्टानि च वज्जीनि स्यु:॥ असति समावेऽन्येषा तान्येव च सुप्रचालितपीघानानि सुधूपितानि सुग्रद्वग्रक्ताय्युपयीगं गच्छेयु:। धूपनानि पुनर्वाससां ग्रयनासरयप्रावरयानाञ्च यवसर्षपातसीहिङ्गुगुग्जवचाचीरकवयः स्थागीलीमीजटिलापलइ पाशीकरीहिणीसर्पनिमार्गिकानि धारणीयाः क्सारस्य खङ्गर्गवयष्ट्रप्रभानां **ध्रतसम्प्रयक्तानि** <del>स्</del>य: ॥ मणयय जीवतामेव दिच्चियो विषाधिस्योऽयाणि ग्रहीतानि स्यः। मन्तायाशीषघयी जीवकर्षभकी 🕹 च यान्यप्यन्यानि ब्राह्मणाः प्रश्रंसेयुः । अत्रौड़नकानि खंखनस्यं तु विचिचाणि घीषवन्यभिरा-माणि अगुरुखती च्यागानि चनास्यप्रविशीनि अप्राणहराणि अविवासनानि स्य:॥

Susruta directs that there should be a particular room provided for patients who have undergone surgical operations. In "Patients suffering from surgical diseases as inflammatory swelling, wounds &c. should, from the very commencement of their illness, confine themselves inside a clean house, situated in a wholesome locality, free from draughts and not exposed to the glare of the sun. For, in such a building, constitutional, mental and accidental diseases are not likely to occur. In that room, the bed for the patients should be soft, spacious, and well-arranged. The patient should lie down, his

ग्रिक्तः प्रथममेवागारमन्विच्छेत्तज्ञागारं प्रशस्त्रवास्त्वादिकं कार्यं। प्रशस्त्रवास्त्रनिग्ट हे श्रचावातपवर्ज्जिते। निवाते न च रीगाः सुरः शारीरागनुमानसाः॥ तिचान् श्यनमसम्बाधं खासीणें मनीज प्राकृशिरस्तं सशस्त्रं कुन्बीत । सुखचिष्टाप्रचारः स्पात् खासीर्षे शयने वनी। प्राच्यां दिश्रि स्थिता देवासतपुनार्थं नतं शिरः॥ तिकान सुद्धित्नुकूलैः प्रियम्बदैक्पास्यमानी यथेष्टमासीत्। सञ्चरी विचिपन्याग्र कथाभिर्वणवेटनाः। श्राप्रवासयन्ती वहुशस्त्रनुकूलाः प्रियम्बदाः॥ न व दिवानिद्रावश्याः सत्रात्। दिवासप्राइणे कण्डूर्गावाणां गौरवं तथा। श्वययुर्के दनारागः सावश्वेव सम्भं भवेत॥ खत्यानसंवेशनपरिवर्त्तनचंक्रमणीचैभीषणादिषु चात्मचेष्टाखप्रमत्ती व्रणं संरचित्। स्थानासनं चंक्रमणं यानयानातिभाषणं। ब्रणवात्र निषेवेत श्रतिमानपि मानव:॥ उत्यानायासनं स्थानं प्रयां चातिनिषेविता । प्राप्त्रयान्यादतादङ्गे रजस्तमाहिवर्जंयेत ॥ गम्याणाच स्त्रीणां सन्दर्भन्मसन्धावणसंस्पर्भनानिदूरतः परिचरित्।

head pointing towards the east, and keep there some weapon for his own protection. On such a bed, the patient can lie comfortably and turn to his sides at pleasure. He should be surrounded by his dear friends, for their sweet words relieve the pain of inflammation. The female friends, however, should be avoided and kept at a distance. He should observe strictly the orders of the surgeon as regards his food, drink and mode of living. He should have his hairs clipped and nails pared short, be pure in his person, put on white clothes and devote himself to religious duties. A light should be kept burning; and garlands of flower, weapons &c., should be provided in the room to ward off the demons. He should be cheered and inspired by pleasant stories; and the physicians and the priests should attend the patient morning and evening. Pastils made of Sinapis Nigra and Azadirachta Indica with clarified butter and salt, should be burnt in the room morning and evening for ten days continually. The inflamed part should be fanned with a cāmar or yolk-tail. Sleep during the day, exercise and sexual intercourse must on no account be indulged in."

Susruta also describes the kitchen of the king thus:—
"That is the proper kitchen which is built on good ground,
towards an auspicious quarter, full of utensils for cooking,
spacious, clean, provided with windows guarded by a network,
frequented by friends, cleared well of grass furnished
with a canopy, purified by auspicious ceremonies, and
managed by men and women of good character. The superintendent of the kitchen should, like the doctor, be noble and
virtuous. The cook and servants should be pure, noble, capable,
mild, good looking, engaged in their respective duties,
high-minded, should have their hairs and nails cut short, steady,

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well-bathed, of subdued passion, well-dressed, obedient and have their heads well-covered."

"The doctor in charge of the kitchen should be of noblo family, religious, friendly, a clever manager for getting king's food properly prepared, ever careful for his health, non-avaricious, simple, fond, grateful, good-looking, cool-tempered, well-behaved, not proud and envious, laborious, of subdued passion, forgiving, pure, of good character, kind, intelligent, not easily fatigued, always loving, well wisher, capable, bold, clever, skillful, not unreasonably tender, provided with medicines and well proficient in the art of healing."

क्रजीनं घार्मिकं सिग्धं सुम्हतं सततीत्थितं। चलचं चामाठं भतां सतामं प्रियदर्भनं॥ क्रीधपारव्यमात्सर्यं मदालसा विवर्ज्जितं। जितेन्द्रियं चमावनां ग्रुचिं ग्रीलदयान्वितं ॥ मेघाविनमसंश्रान्तमतुरक्तं हितैविगां। पट्ं प्रगत्भं निपृषां दत्तं मायाविवर्ज्जितं॥ पूर्वोत्तेय गुणैयु का नित्यं सनिहितागदं। मद्दानसे प्रयुद्धीत वैद्यं तिहद्यपूजितं॥ प्रशस्तिवर्शकतं ग्रचिभाग्डं महक्कृचि। सजालनं गवाचाढा मात्मवर्गं निषेतितं॥ विकचस्टसंस्टं सवितानं क्रतार्चनं। परीचित स्त्रीपुरुषं भवेद्यापि महानसं॥ तनाध्यत्तं नियुष्तीत प्रायी वैद्यगुणान्वितं। ग्रुचयी दिच्छा दचा: विनीता: प्रियदर्शना: ॥ सविभक्ताः सुमनसी नीच विश्वनखाः स्थिराः। स्नाताहरः संयमिनः क्षतीणीषाः सुसंयुताः ॥ तस्याचाज्ञा विधेयासुः विविधाः परिकर्सिणः । भाद्वारिस्ति यशापि भवित प्राणिनी यत:॥ तसाना इानसे वैद्य: प्रमाद रिइती भवेत्। माद्वानसिक वीदार: सौपौदनिक पौपिका:॥ • भवेयुवै द्यवश्रगा ये चाप्यन्ये तु केचन। इङ्गितङ्गी मनुष्याणां वाक्चिष्टमुखवैक्रते: ॥

In the Kamandakiya Nitisara, we find the king advised to take thoroughly examined food, and to be surrounded by physicians well-versed in the science of Toxicology; and again it is said that king should take his medicines, cordials, and edibles after having his medical attendants tasted them. The king is advised to kill his enemy by weaning over his physician or by administering poisonous liquids.

In the Mahavaggas we find the qualities of a good patient and a good nurse described:—

"6. What are five qualities, O Bhikkhus, which when a sickman has, he is easy to wait upon—

When he does do what is good for him; when he does know the limit (of the quantity of the food) that is good for him; when he does take his modicine, when he does let a nurse who desires his good, know what manner of disease he has, or when he is getting worse that that is so, or when it is getting better that that is so; and when he has become able to bear bodily pains that are severe, sharp, grievous, disagreeable, unpleasant and destructive to life. These are the five qualities, O Bhikkhus, which when a sickman has, he is easy to wait upon.

विषय्वेषद्वे: बातः विषय्ननिमृतितः । यरोचितं समनीवाज्यामुजाविषयनमाः ॥ १० ॥

Kamandakya Nitisara vii. v. 148.

श्रीवधानि च सर्वानि यानं यानीयस्व च । तन्त्रकायकै: समाव्याचा प्राचीयातीजनानि च ॥ ५० ॥

Ibid. vii. v 27.

भिष्मेदेन वा अबं रसदानैन साम्बेर्य ॥ ०० ॥

Bid. IX. v. 70.

<sup>·</sup> Mahavagga viii. 26, 6 & 8 (Sacred Books of the East).

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8. There are five qualities, O Bhikkhus, which, when one who waits upon the sick has, he is competent to the task—when he is capable of prescribing medicines; when he does know what (diet) is good and what is not good for the patient, serving what is good and not serving what is not good for him; when he does wait upon the sick out of love, and not out of greed; when he does not revolt from removing evacuation, saliva or vomit; when he is capable of teaching, inciting, arousing and gladdening the patient with religious discourses. These are the five qualities, O Bhikkhus, which, when one who waits upon the sick has, he is competent to the task."

There is also good deal of evidence to show that medicines were distributed free to the poor and to the pious men. When Viṣakhā asked for eight boons of the Buddha, she mentioned amongst them the previlege of bestowing her life long "food for the sick, food for those who wait upon the sick and medicines for the sick" and explained her reasons as follows:—

"9. Moreover, Lord, if a sick Bhikkhu does not obtain suitable foods, his sickness may increase upon him, or he may die. But if a Bhikkhu have taken the diet that I shall have provided for the sick neither will his sickness increase upon him, nor will he die. It was this circumstance, Lord, that I had in view in desiring to provide the Samgha my life long with diet for the sick.

Moreover, Lord, a Bhikkhu who is waiting upon the sick if he has to seek out food for himself, may bring in the food (to the invalid) when the sun is already far on his course, and he will lose the opportunity of taking his food. But when

<sup>1</sup> Mahāvāggā VIII, 15-9,

he has partaken of the food I shall have provided for those who wait upon the sick, he will bring in food to the invalid in due time and he will not lose the opportunity of taking his food. It was this circumstances, Lord, that I had in view in desiring to provide the Samgha my life long with food for those who wait upon the sick.

10. Moreover, Lord if a sick Bhikkhu does not obtain suitable medicines his sickness may increase upon him, or he may die. But if a Bhikkhu have taken the medicines which I shall have provided for the sick, neither will his sickness increase upon him, nor will he die. It was this circumstance, Lord, that I had in view in desiring to provide the Samgha, my life long with medicines for the sick."

The Edict No. II of Asoka clearly shows that charitable institutions were common in India, during his reign. The Edict runs as follows:—

"Everywhere in the kingdom of the king Piyadasi, beloved of the gods, and also of the nations who live in the frontiers such as the Cholas, the Pandyas, the realms of Satyaputra and Keralaputra, as far as Tambapani, (and in the kingdom of) Antiochus, king of the Greeks and of the kings who are his neighbours, everywhere the king Piyadasi, beloved of the gods, has provided medicines of two sorts, medicines for men and medicines for animals. Wherever plants useful either for men or for animals were wanting they have been imported and planted. Wherever roots and fruits were wanting, they have been imported and planted. And along public roads, wells have been dug for the use of animals and men."

We also learn from Houen Tsang's account that Siladitya II

(610-650 A.D.) was inclined towards Budhism and h forbade the slaughter of living animals, built stupus, and "in all the highways of the towns and villages throughout India, he erected hospices, provided with food and drink, and stationed there physicians with medicines for travellers and poor persons round about, to be given without any stint."

He also mentions about the father of the Bhikkhu Srutavimsatikoti, that "from his house to the snowy mountains, he had established a succession of rest-houses, from which his servants continually went from one to the other. Whatever valuable medicines were wanted, they communicated the same to each other in order, and so procured them without loss of time, so rich was this family."<sup>2</sup>

He also mentions charitable institutions called Punyasalas as common in India. "There were formerly in this country (Tsch-kia-Takka) many houses of charity (goodness or hppiness, Punyasalas) for keeping the poor and the unfortunate. They provided for them medicines and food, clothing and necessaries; so that travellers were never badly off."

Again he says: "Benevolent kings have founded here (Mo-ti-pil-lo or Matipura) a house of "merit" (Punyaśalas). This foundation is endowed with funds for providing choice food and medicines to bestow in charity on widows and bereaved persons, on orphans and the destitute." A similar Punyaśala or hospice was in K'ei-P'an-to (Kabandha). In describing

<sup>&</sup>lt;sup>1</sup> Beal's Record, Vol. I, p. 214.

<sup>&</sup>lt;sup>2</sup> *Ibid*, Vol. II, p. 188.

<sup>&</sup>lt;sup>3</sup> Ibid, Vol. I, p. 165.

<sup>4</sup> Ibid, Vol. I, p. 198.

<sup>&</sup>lt;sup>8</sup> *Ibid*, Vol. II, p. 303.

Multan he says: "They have founded a house of mercy (happiness), in which they provide food, and drink, and medicines for the poor, and sick, affording succour and sustenance." Of Siladitya he says: "Every year he assembled the Sramanas from all countries, and on the third and seventh days he bestowed on them in charity four kinds of Alms (viz.—food, drink, medicine, clothing)."

Fa Hian (405-11 A.D.), a contemporary of Candragupta Vikramaditya, describes the charitable dispensaries in the town of Pataliputra thus:—"The nobles and householders of this country have founded hospitals within the city to which the poor of all countries, the destitute, cripple and the diseased may repair. They receive every kind of requisite help gratuitously. Physicians inspect their diseases, and according to their cases order them food and drink, medicines or decoctions, every thing in fact that may contribute to their ease. When cured, -they depart at their convenience." Smith remarks: "No such foundation was to be seen elsewhere in the world at this date; and its existence, anticipating the deeds of modern Christian charity, speaks well both for the character of the citizens who endowed it, and for the genius of the great Asoka whose teaching still bore such wholesome fruit many centuries after his decease. The earliest hospital in Europe, the Maison Dieu of Paris, is said to have been opened in the 7th centuries."4

"Upatisso, son of Buddha Das, builds Hospitals for cripples,

<sup>&</sup>lt;sup>1</sup> Beal's Record, Vol. II, p. 274.

<sup>&</sup>lt;sup>2</sup> Ibid, Vol. I, p. 214.

<sup>\*</sup> Ibid, Vol. I, Intro. lcii.

Smith's Early History of India, 2nd Ed., p. 280.

for pregnant women, and for the blind and diseased. 1 Thatushena builds Hospitals for cripples and sick<sup>2</sup>. Buddha Das<sup>3</sup> himself ordained a physician for every ten villages on the high road, and built assylums for the crippled, deformed and destitute."

The animal Hospitals or Pinjrapoles which still exist at Ahmedabad, Surat, and Sodepore in Bengal, and elsewhere may be regarded as the survivals of the institutions founded by the Maurya monarch. The following account of the Surat Hospital in the 18th century is from the pen of Hamilton:—

"The most remarkable institution in Surat is the Banyan Hospital, of which we have no discription more recent than 1780. It then consisted of a large piece of ground enclosed by high walls, and sub-divided into several courts or yards for the accommodation of animals. In sickness they were attended with the greatest care, and here found a peaceful assylum for the infirmities of old age.

"When an animal broke a limb, or was otherwise disabled, his owner brought him to the Hospital, when he was received without regard to the caste or nation of his master. In 1772 this hospital contained horse, mules, oxen, sheep, goats, monkies, poultry, pigeons, and variety of birds; and also an aged tortoise, which was known to have been there seventy-five years. The most extraordinary ward was that appropriated for rats, mice, bugs, and other noxious vermins for whom suitable food was provided."

<sup>&</sup>lt;sup>1</sup> Mahawanso, p. 249. <sup>2</sup> Ibid, p. 245. <sup>3</sup> Ibid, p. 256. <sup>4</sup> Channingham

<sup>\* 101</sup>d, p. 256. 
Cunningham's Bhilsa Topes, p. 54, foot united Hamilton's Description of Hindustan (120) Vol. I, p. 718, quarter of Crooke. Things Indian, Art. Pinjrapole, (Murray 1906).

We quote here from Hemādri the opinions of the sages and the Purānas as to the merit of the founder of a hospital :-

#### Visvamitra.

There is no gift more precious than the gift of cure; therefore it should be given freely to the sick to augment one's good fortune. He who gives medicines, diet, food, oil for smearing and shelter to the sick, becomes free from all diseases.

#### Samvartta.

The giver of medicines, oleaginous remedies and food for the cure of the sick, becomes free from all diseases, happy and long-lived.

## Agastya.

Those who give rice and medicines freely attain happiness, being free from desease.

## Saura Purana.

He, who gives medicines to the sick to cure their diseases always remains healthy, long-lived and happy.

## <sup>1</sup> श्रथ श्रारोग्यदानं । तचारीग्यदाननाव दुच्चते ।

## ग्राष्ट्र विध्वामिनः।

भारीग्यदानात्परमं न दानं विद्यति कचित्। भतीदेयं क्जार्मानामारीग्यं भाग्यवद्वये॥ भौषधं पद्यमाहारं तैलाभ्यक्प्पतिश्रयं। यः प्रयक्कृति रोगिस्यः समविद्याधिवर्जितः॥

## संवर्तः।

भीषमं सेष्ट्र माहारं रीगियां रीगग्रान्तये। इदानी रीगरिहतः सुखी दीर्घायुरिव च॥

### Nandi Purana.

The high-souled man who gives the Brahmins collyrium in charity to cure the diseases of the eye, goes to the Sun (after death) and becomes free from eye deseases, fine-looking and fortunate.

Good health is a step to the acquirement of religious merit, wealth, pleasure and final emancipation, and so the man who bestows cure to the sick and also he who erects a hospital equipped with good medicaments, dresses, learned doctors, servants and rooms for students, always gain them. The doctor should be well-versed in the religious treatises, experienced, familiar with the actions of medicines, a discriminator of the colour of the roots of the herbals and well-acquainted with the

#### घगस्य:।

भन्नी-षधप्रदातारः सुखं यान्ति निरामयाः।

# सीर पुराणे।

रोगिषी रोगमान्यर्थमीषष यः प्रयक्तति। रोगहीन: स दोर्घायुः सखी भवति सर्वदा॥

## नन्दि पुराणे।

षञ्जनं यी नरीदबादचीव्यीचिनिव्यत्त्री। विप्राय स पुसान् याति स्थालीकं महामति:। षारीग्यनयनी दिव्य: सुभगी जायते नर:॥

# तिस्मन्नेव पुराणे।

घर्मा-ध-नाम मीचायां आरोग्यं साधनेयुँतः। अतस्तारोग्यदानेन नरी भवति सर्व्वदा॥ आरोग्यभावां तुरुते महीषधपरिकदाः। विदन्धवैद्यसंयुक्तां सत्यावसधसंयुताः॥ proper season of raising them from the ground, well-trained with the qualities of the juices, (their strength and actions), sali rice, meat and medicaments, trained in compounding medicines, one who knows well of the physique of men by intelligence, one who knows the temparament and the qualities of the diet, a pathologist who is not idle, well acquainted with the remedial agents for the premonitary signs and sequelæ of diseases, proficient in the requirements of time and place, well-read in the medical text-books—the Ayurveda with its eight divisions and an expert in curing diseases by domestic remedies (prepared from handful of common ingredients).

The pious man who erects such a hospital in which the services of good physicians of this nature are retained, becomes celebrated as the virtuous, the successful and the intelligent

वैद्यस् आस्त्रवित् प्राज्ञी दृष्टीषधपराक्रमः ।
भौषधोमूलवर्षज्ञः समुद्ररणकालवित् ॥
रसवीर्व्यविपाक्रज्ञः आलिमांसीषधीगणे ।
सीगविद्देष्टिनां देष्टं यी धिया प्रविभेद्देषः ॥
धातुपष्यमयज्ञय निदानविदतन्द्रितः ।
व्याधीनां पूर्व्यलिङ्गज्ञसदुत्तरविधानवित् ॥
देशकालविधानज्ञयिकित्साशस्त्रविक्त्या ।
स्रष्टाङ्गायुर्वेदवेता मुष्टियोगविधानवित् ॥

# अष्टावङ्गानि श्रायुर्वेदस्य।

यथात्रख्यं श्रालाक्यं कायचिकित्सा भूतिवद्या कौमारभ्रत्यमगदतन्त्रं रसायणतन्त्र वाजी-करणतन्त्रमिति सुशुतीकानि ।

एवं विधः ग्रभी वैद्यी भवेदात्राभियीजितः।

शारीन्यशालामवन्तु कुथादीचर्मसंस्थयः॥

स पुमान् धार्मिको लीके स क्रतार्थः सबुद्धिमान्।

सस्यगारीन्यशालायामीष्यः सेहपाचनः॥

man in this world. If in such a hospital the kind-hearted man can cure a single patient of his maladies by simple medicines, oleaginous remedies and compounds of medicinal decoctions, goes to the Brahma's residence with his seven generations upwards. The rich and the poor acquire religious merit in proportion to the amount of riches they possess; where would the poor man get a hospital and a young physician to cure his diseases? The man secures the eternal regions mentioned before by rendering the sick healthy by the use of roots to some and by good rubbing (with external applications) to others. He who cures the sick suffering from an increase or decrease of the Air, the Bile and the Phlegm by simple remedies, he too goes to such blessed regions (after death) as are secured by those who perform many religious sacrifices (Yajñas).

व्याधिनं विश्वी क्रल ष्ययेनं क्ष्यायुतः।
प्रयाति ब्रह्मसदनं कुलसप्तकसंयुतः॥
षाक्यी वित्तानुसरिष दरिद्रः फलमाग् भवेत्।
दरिद्रस्य कृतः शाला षारीग्याय भिषग्युवा॥
षपमूलिन केनापि मईनावैरयापि वा।
सस्योक्षते भवेन्मत्तें पूर्वीतं लीकनव्ययं॥
वात पित्त-क्षाद्यानां च्या-पच्यभेदिनां।
यस्तु स्वाभ्युपायेन मीचयेत् व्याधिपीड़ितान्॥
सीपि याति श्रभान् लोकान् ष्रवाप्यान् यज्ञयानिभिः।

# स्कन्दपुराणे।

भारीग्य मालां यः कुर्यात् महावैद्यपुरक्तृतां। सर्व्वीपकरणीपेतां तस्य पुर्ख्यफलं प्रयु॥ धर्मा-ध-काम-मीचाणामारीग्यं साधनं यतः। तक्षादारीग्य दानेन तहत्तं स्याचतुष्यं॥ भयेकमार्से विदासं स्वस्थीकत्य प्रयवतः। प्राप्नीति सुमहतम्पुर्ख्यमनन्तं चयवर्जितं॥ भागवीगरतं भानं रीगार्से भिवयीगिनं। यः स्वस्यं कुरते सीपि सर्व्वदानम्मलं स्रोत्॥

## Skandapurana.

Hear, the amount of religious merit secured by a man who erects a hospital containing all the necessary articles (of treatment) and in which are engaged eminent physicians by reward. As good health is the means of attaining religious merit, wealth, pleasure and final emancipation, therefore, he by rendering the sick healthy, gives these four blessings.

By carefully curing a learned man of his sickness great merit is secured, which is eternal and indestructible. He too who cures a sickman who is calm and absorbed in meditation of Siva and knowledge, attains the virtue of all kinds of gifts. Bramhā, Vishu, all the gods, diseases, relatives and kings—they are obstacles to yoga but not to those who perform it (yogi). Whatever merit is obtained by the great, by supporting the sick Brāhmans (priests), Kshatriyas (warriors), and Bith (cultivators) and Sudras (servants), can not be obtained by the performance of all the great Yajñas (religious ceremonies). As even the gods can not reach the end of the

ब्रह्मा विषाः सुराः सव्वै व्याघयः सजना नृपाः । ब्रह्म-चिन्य-विट्-ग्रहान् रीगार्तान् परिपाल्य च । यसुष्यं महदाप्रीति न तत्ववैंमेहामखेः ॥ भाकाशस्य यथा नानः सुरैरप्युपलभ्यते । तहदारीग्यदानस्य नानीवै विद्यते कचित् ॥ पुष्येनानेन महता गला शिवपुरं नरः । मीदते विविधेभौगैर्विमानैः सर्वेकामिकः । एकविंशत्कुलीपेतः सम्रत्यः परिपालितः । भासे शिवपुरे सावद्यावदाइतसंद्वनं ॥ ततः स्वष्यंशिक्ष संप्राप्तः प्रयतः सदा । कानमुत्यद्यते तसा कट्नेस्यः पिच्चारकः ॥

\* स्वेन योगिनामिति वा पाठ:।

firmament, so there is no end (to the merit) of the gift of curc. By this great merit, the man reaching the region of Siva enjoys himself by soaring in a balloon which can go to the various desired directions. With his twenty-one generations upwards and surrounded by his servants, he stays in the Siva's realm so long till deluge does not occur. There, after the lapse of his merit, the devoted servant acquires knowledge from Siva.

Abandoning this world by knowledge, abiding by the prayers to Siva, and casting away this body as a straw, he reaches beyond the limits of sorrow. Being freed from all sorrows, becoming pure, all-knowing and self-sufficient, and absorbed in his ownself, they are called the Liberated. Therefore to mitigate the diseases, the sick should be well nursed; the great sages should especially be attended to even by the sacrifice of one's body or riches. The wise must not irritate the weak patients, and they like the preceptors should be rescued constantly from sins. He who relieves the sick, by taking them under his care, reaches the other bank of this ocean of world.

ज्ञानादिरतः संसाराच्छिवध्यानसुपार्यितः।
सदिष्ठं दृष्णवन्त्रज्ञा सर्व्यदुःखानसापुयात्॥
समसदुःखनिन्धुतः ग्रुष्ठः स्वात्मव्यवस्थितः।
सर्व्यतः परिपूर्णय सुत्तं द्रव्यभिषीयते॥
तन्त्राङ्गोगापवर्गाष्ठं रोगान्तं ससुपाचरित्।
विग्रेषेष तु योगीन्द्रं भरीरेष घनेन च॥
रोगिषी नीडिजेत् प्राज्ञी दुर्व्वलानिप सर्वदा।
तान् पापाद्गु स्वतित्यमेवस्वसः प्रवर्ष्यते॥
योत्रग्रङ्गीतमातानं सन्यमानी दिने दिने।
स्पर्सर्पत रोगार्मसीर्णस्तेन सवार्णवः॥

# इत्यारीग्यदानं ।

Hemādri's Caturvarga, Cintamoni, Dana Khandam. Asiatro Soc. Ed. Ch. XIII. P. 891—95. After these proofs, the statement of Mr. Ameer Ali that "the Arabs invented chemical pharmacy, and were the founders of those institutions which are now called dispensaries" can not be accepted as correct.

#### DISPENSARIES.

As regards dispensaries, Susruta advises the physician to construct his dispensary in a clean locality; and the building should face towards some auspicious direction as the east or the north. He says:—"The medicines should be kept in burnt earthen pots arranged on planks supported by stakes or pins". This is still the method of storing medicines used by the Kavirājas. Dallvaṇa explains the passage thus:—"The medicines should be kept in pieces of cloth, earthen pots, wooden pots and Śańku (kīlaka)." The former explanation is plausible for it is impossible to imagine how a kīlaka or stake can be a container of medicine, unless it is implied as a point of support for hanging the medicine vials from it.

Dr. Heyne (1814) thus describes the ancient dispensaries of the Hindus: "The place in which medicines are kept should

Suśruta Samhitā. I. xxxvii.

<sup>&</sup>lt;sup>1</sup> History of the Saracens p. 262, 1899.

क्षीतस्वद्वाण्डफलकमाङ्गुविन्यस्तमिषनं प्रमाशतार्था दिग्रि श्वचौ मेषनागारमिष्यते॥

<sup>&</sup>lt;sup>3</sup> ग्रहीतीवघसंस्थापनीपायं दर्भयद्वाहः,—द्वीतिति। द्वीतः वर्षयखंड, स्दा भाष्डं, स्त्भाखं। फंलकं पृष्टकं इति पुस्तकालरि पाठः, श्रङ्कः कीलकः, एतेषु द्वीतादिषु विन्यसं धृतं भेषनं यद्विन् ग्रहे तत् भेषनागारं भेषनग्रहिमध्यते इति सस्वन्यः। प्रश्रसायां दिशि पूर्वस्थासुत्तरस्यां वा, श्रची देशे प्रस्तिन् भूमिप्रविभागीयाध्याये, निवन्धेषु व्यत्ययेन न पाठी दृश्यते। श्रक्ताभित्तं इत्तक्रमरीत्येव पाठी लिखित इति सर्व्वावयवसाध्येषित्यादि यावववं दृव्यं पुराणश्चेति पाठं केचिदाचार्था न पठिन ॥

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be clean, dry, and not accessible to rats, white ants or dust.

The drugs ought to be put in nets, or large pots, the mouth of which must be tied over with a piece of cloth, and suspended in a room. Fire, smoke and water must be kept at a distance.

The house in which medicines are stored, should be neither in too high nor too low a situation, and it should not be far distant from places in which medicines may be collected. Its front should face either the south or the north, with a convenient *viranda* before the door of the same side.

The necessary apparatus for mortars, scales, &c., must be kept in a place in the wall that has been consecrated for that purpose by religious ceremonies."

After describing the different classes, and members composing each class, of medicines, Susruta continues: "The wise physician should collect and classify these medicines, and with them prepare external applications, infusions, oils, ghee, syrups, &c., as required for derangement of a particular humour. The medicines should be carefully preserved in all seasons, in rooms free from smoke, rain, wind and dust. The medicines should be used singly, or in combinations of several medicines of a class, or of an entire group, or of more than one group, according to the nature of the disease, and the extent of derangement of the humours."

पिमलें पान् कषायांत्रच तैलं सपीं विपानकान्। प्रविभज्य यथान्यायं कुर्ल्णीत मितमान् भिषक्॥ पूमवर्षानिलक्केदै: सर्व्वर्ज्ञ्जनिमदुते। याइयिला राहे न्यस्येहिधिनीवधसंग्रहं॥ समीत्य दीवभेदांत्रच गणान् भिन्नान् प्रयोजयेत्। प्रयक्षित्राण् समसान् वा गसं वा व्यससंहतं॥

#### ANÆSTHETICS.

In the medical text books of the Hindus, there is no mention of a general anæsthetic, from which we can infer that it was unknown in those ancient days. There are, however, many indications to show that the earlier surgeons felt the necessity of such an agent to produce insensibility to pain. Both Caraka and Susruta mention the use of wine to produce the desired effect. Caraka says: "After extraction of a dead futus before the full term of pregnancy, wine should be prescribed to her, for that will improve the condition of her uterus, make her happy and alleviate the pain of the operation."1 Susruta, however, distinctly lays down that "wine should be used before operation to produce insensibility to pain." He again remarks: "It is desirable that the patient should be fed before being operated on. Those who are addicted to drink and those who cannot bear pain, should be made to drink some strong beverage. The patient, who has been fed, does not faint, and he who is rendered intoxicated, does not feel the pain of the operation."2

The use of certain drugs to produce anæsthetic effects was well known to the ancient Greeks and Romans. Dioscorides

Caraka Samhitā, IV, viii.

Suśruta Samhitā, I, xvii.

स्थपतत्रक्तिंश्रान्तु स्त्रियमामगर्भी सुराश्रीध्वनिष्टम्युमदिरासवानामन्यतमन्त्रे
 सामध्यतः पायशैत गर्भकोष्ठविश्वस्त्रार्थनिसिविस्तरणार्थं प्रदर्भसार्थेत्व ॥

प्राक्षस्त्रक्षसंग्रेष्ट' भीकयेदातुरं भिषक् । भदापं पाययेन्यदां तीच्यं यीऽवेदनासहः ॥ म मूर्च्छत्यत्रसंयीगान्यतः सस्तं म बुध्यते । तक्षादवस्यं भीक्तव्यं रीगेषूत्तेषु कर्मानि ॥ प्राची क्षाध्यन्तरी नृगां वाद्यप्राणगुचान्वितः । धारयत्यविरोधेन यरीरं पाद्यभीतिनं ॥

mentions Mandragora (Mandragora Atropa) to have been employed internally as a hypnotic and anæsthetic. Pliny (32-79 A.D.) in his Natural History mentions that this anæsthetic was also used by inhalation; and this fact is corroborated by Galen, The Arabian physicians also Arætæus, Celsus and others. used it. The Chinese surgeons still use some powder (Indian hemp probably) to throw their patients into profound sleep. In the 13th century Theodoric (died 1298) described the "spongio somnifera" the vapours raised from which were capable, when inhaled, of setting patients into an anæsthetic sleep, thus inducing insensibility to the agony and torture of a surgeon's knife. Baptista also mentions his "Pomum somniferum", to be made with mandragora, opium, &c. The Hindus also inhaled the fumes of burning Indian hemp as an anaesthetic at a period of great antiquity. As early as 927, A. D., they also knew drugs which they employed for the same purpose, for Pandit Vallāla, in his Bhoja Prabandha, alludes to a cranial operation performed on the King Bhoja after he was rendered insensible by some drug called Sammohini (producer of unconsciousness). Another drug is also mentioned, Sanjībanī (restorer to life), by which he soon regained consciousness after the operation had been finished.1

ततसाविप राजानं मी हचूर्णेन मी हियाला शिर: कपाल मादाय तत् करीटिकापुटे स्थितं श्रम्पक्तं रहें होला कि सिंधि हाजने निचिष्य सन्धानकरणया कपालं यथावदारच्य सञ्जीवनगा व तं जीवियला तसे तह श्रयताम्।

Bhoja Prabandha (Jibānanda's Edn.), P. 98.

#### CHAPTER III.

#### MATERIALS OF INSTRUMENTS.

#### IRON AND STEEL.

In the Rgveda, ayas, (Latin aes), next to gold, is the metal most often referred to. Ayas often stands as a generic name to mean simply "metal," though in later works it signifies iron as a rule. The mention of dark and red ayas in the Atharvaveda indicates a distinction between iron and copper or bronze. The surgical instruments of the Hindus are recommended generally to be made of iron; but Susruta allows other suitable material when iron of good quality is not available. He says: "A wise surgeon should get the instruments made of pure iron and with sharp edges by an expert blacksmith who is skilful and experienced in his craft." The use of impure iron as a material for surgical instruments, he deprecates as a defect and advises the surgeons not to rely on such instruments.

The Hindus were acquainted with steel and they knew how to turn out steel of fine quality from a pure iron ore. Nagarjuna, the well known Buddhist chemist, wrote a scientific

Susruta Samhitā, I, vii.

श्रक्ताख्येतानि मितिमान् ग्रह्मैक्यायसानि तु। कारयेत् करणै: प्राप्तं कक्षीरं कक्षीकीविदं॥

Ibid, I, viii,

तानि प्रायशी लीक्वानि भवन्ति तत्प्रतिकपकाणि वा तदलाभे।

treatise on steel and iron. Sibodāsa in his commentary on Chakrapāņi quotes Patanjali as an authority on the subject. In the Dhanurveda, Vīracintāmaņi, Śārangadharapaddhati and Lohārnava, steel as a material of sword has been described and classified.

Dr. Mitra quotes some references about the knowledge of iron possessed by the ancient Hindus from the Rgvida. He finds that "swords (II. 156), spears (IV. 25), javelins (II. 292), lances (I. 774), (IV. II. 288) and hatchets (I. 120) are frequently mentioned; and these weapons were bright as "gold" or golden (IV. 19), "shining bright" (I. 175), "blazing" (IV. 93), "sharp" (IV. 113) and "made of iron" (I. 226); they are "whetted on a grind stone" (II. 36) to improve their keenness (I. 150), and "polished to enhance their brightness" (II. 326)......"According to Neurchus. King Porus gave 30 lbs of steel to Alexander as the most precious present he could offer."

Royle also remarks<sup>4</sup>: "Working in metals they have long been famous for: their steel acquired so great celebrity at an

Cakradatta, Rasāyanādhikāra.

अर्बयिता विघानेन द्वरम्बं गुरुभास्तरी। वीतपालान् ग्रहांसैव चेत्रपालानधीषधम्। श्रादित्यदेवतासेहा धन्वनारी-पतझली द्वाहलिस सर्वोधी नानाभचीपशारतः॥

> Quoted in Sibodas's commentary on Louhamarana-Vidhi în Cakradatta.

गागार्ज्नो सुनौन्द्र शशास यह्नोहशास्त्रमतिगहनम्। तस्यार्थस्य सृतये वयमेतिहिश्रदाचरैर्द्रमः॥

<sup>&</sup>lt;sup>3</sup> Dr. R. L. Mitra's Indo-Aryans, Vol. 1, P. 301. See Wilson's Rgvetla.

<sup>4</sup> Royle's Antiquity of Hindoo Medicine. Pp. 46-7.

early period, as to have passed into a proverb among the Persians, where *fouladee hind* indicates steel of the best quality; and *juwabee hind*, an Indian answer, means a cut with a sword made of Indian steel."

#### COPPER.

Pure copper was also used as a material of instruments; and vessels and instruments of copper are frequently mentioned in the medical books of the Hindus. A copper probe for applying antimony to the eye has been found in the excavations of Bijnor and another in the Bihat excavations. Cakradatta¹ advises us to use a copper probe for the application of lekhana collyrium; and susruta mentions a copper needle in the operation for reclination of cataract.²

#### TIN.

Tin was also used as a material of blunt instruments. Susruta mentions plates of tin to surround a tumour and to protect the healthy parts, before the application of actual cautery.<sup>3</sup> Such plates are recommended to be made of tin, or lead, or copper, or iron.

#### LEAD.

Tubes of lead were used for purpose of fumigation. Probes made of lead were used for application of collyrium. The use

Cakradatta, Afijanadhikāra.

Suśruta Samhitā, VI. xvii.

<sup>&</sup>lt;sup>1</sup> प्रशस्ता लेखने तासी रीपने कालली हजा।

<sup>&</sup>lt;sup>2</sup> तामायसी भातकीभी भंखाका स्यादनिन्दिता।

अल्लाविश्वष्टे क्रिमिन: क्रिते च लिखेत्ततीऽग्निं विद्यीत प्रयात्।
 यदत्त्पमूलं वपुतामसीस पृष्टे: समाविध्य तदायसैर्व्या।
 चाराग्निश्रात्माखा सक्रद्विद्यात् प्रानायहिंसनं भिष्णप्रमत्तः॥
 Suáruta Sambita, IV. xviii.

of lead plates to sorround tumours before application of actual cautery has been noted above.

#### BELL-METAL.

The use of bell-metal—an amalgam of zinc or tin and copper, 25 parts of the former with 75 parts of the latter,—as a material of probes for applying collyrium, is mentioned by Susruta.<sup>1</sup>

#### GOLD AND SILVER.

Gold was known to the Hindus from the remote antiquity; and among the metals, it is the one most frequently<sup>2</sup> mentioned in the Rgveda. Silver was perhaps unknown during the earlier Vedic age, from its name being not mentioned in the Rgveda. But no conclusion can safely be drawn from this argument<sup>3</sup>. We find, however, gold, silver, and other precious

Susruta Samhitā, VI. xviii.

<sup>2</sup> "निष्काग्रीव"

Rgveda. 5 Mandala. 19 Sūkta.

"निष्तेन सुवर्षे न भलडूता गीवा"।

Sayana.

श्रय: न हिम्यावान्।

Ibid. 4 Mandala, 2 Sükta.

"सुवर्ष निर्मित कच्यावान् अश्वः"।

Sāyana.

"A horse with golden caparisons"-Wilson.

<sup>8</sup> "एनीं रियं"।

Rgveda. 5 Mandala. 33 Sükta.

एनवर्षा श्वेतवर्षा रियं घनं।

Sayana.

मीवर्षे राजतं शार्ङ्गनामं वैदूर्थकां सप्रजं भायसानि च यीज्यानि श्रलाकास यथाक्रमं॥

<sup>&</sup>quot;Query, if silver money be intended"-Wilson.

stones mentioned as materials of instruments in the medical books. Gold and silver vessels and plates are often described in Sanskrit literature.1 Suśruta mentions the use of drinking cups made of gold, silver and precious stones.2

Caraka, amongst other things necessary for a lying-in-room. mentions two needles of gold and silver.3 To cut the navelcord of the new-born child, he recommends a knife made of gold, or silver, or iron.4 In the Manusamhita5 we find: "Before the section of the navel string, a ceremony is ordained on the birth of a male; he must be made while sacred texts are pronounced, to taste a little honey and clarified butter from a golden spoon."6 A golden needle is mentioned by

सवर्षकप्यश्रक्षात्रम ग्राप्ति रत मयानि च। कांस्याय साम रैत्यानि एपसीस मयानि च। निर्लेपानि विग्रह्मान्त कैवलेन जलेन तु॥

दति वासी।

<sup>2</sup> सीवर्णे राजते तासे कांसे। मिश्रमिये तथा पुष्पावतंसं भौमे वा सुगन्धि सखिलं पिवेत ॥

Suśruta Samhitā, I. xlv.

- \* \* तीच्णी सचीपिणलकी सीवर्ण राजती हे प्रस्ताणि च तीच्णायसानि । Caraka Samhitā, IV. viii.
- 4 नाभिवन्धनात प्रस्ति द्विलाषाञ्जलमभिज्ञानं क्रला च्छेदनावकाशस्य द्वयीवनारयीः श्रेनर्रं हीला तीच्योन रीकाराजवायसानां हिदनानामन्यतमेनी र्षं धारेन हेदयेत् ॥

Ibid.

प्राक्त नाभिवर्धनात्यंसी जातकर्मा विषीयते। मन्त्रवत्प्रामनं चास्य हिरखमधुसपिषाम्॥

Manusamhitā, II. 29.

Manusamhita (ch. II. V. 29. Jones's trans.) 9

Susruta for pricking the bulb of Soma plant to extract its juice.¹ To cure trichiasis, Cackradatta mentions a needle cautery of gold.² For destroying the hair follicles, he advises us to pass the hot needle into them as soon as the eyelashec are removed by epilation. In the Yogaratnākara, is mentioned a cautery of gold, to burn the fistuious track round the anus.³ Sārngadhara mentions silver or coral pots for keeping medicated snuffs,⁴ and gold and silver tubs for immersing patients in medicated lotions.⁵

#### HORN.

Horns of animals are mentioned as suction-apparatus. For

Suśruta Samhitā, IV. xxix.

प्रविद्यालम् पुंखं रोम सिंहणीरु इरच्छने:। सन्दंशिनी दरिष्ट्यां पच्चरीमाणि वृद्धिमान्। रचत्रचि दहेत् पच्च तप्तहेमश्र्लाकया। पच्चरीगे पुननैव कदाचिद्रोमसन्धव:॥

Cakradatta. Notraroga Cikitsā.

अपानमार्गपिटिकां दहेत् सर्पभलाकया।
अधिप्रतप्तया पथात् कुर्यादगित्रणिकयाम्॥

Yogaratnākara, p. 347. (Anandāsram Series).

की वा मिक्कि प्रधारच हेमतारादि ग्रितिभिः। ग्रक्तावा पाने ग्रक्तावा प्रातिर्वानस्यमाचरित्॥

Śarngadhara Samgraha, III. viii.

कीवर्षं राजतं वापि ताममायसञ्चदार्जः। कीष्ठकं तच कुळीतीच्छाये षठचिंग्रदङ्गुं॥

<sup>\* \* \* \*</sup> सोमकन्दं सुवर्णस्चादिविदार्थ पयोग्रह्वीयात् सीवर्णे पावेऽञ्चलिमातं \* \* \* \*

this purpose, the horn of a cow is recommended.<sup>1</sup> A probe made of horn is advised to be used for applying collyrium. Susruta mentions goat's horn to be used as a container of medicine.<sup>2</sup> He also recommends for this purpose vessels manufactured out of horn.<sup>3</sup> Similarly Caraka advises us to keep medicines in the lamb's horn.<sup>4</sup> Tubes of Vasti-yantra (clysters) are often described to be made of horn.<sup>5</sup>

#### BONE AND IVORY.

Vāgbhaṭa II describes the anguli-trāṇaka or finger-guard to be made either of wood or ivory.

- एतचूर्णाञ्जन' श्रेष्ठ' निह्नित' भाजने श्रमे।
- दन्तस्प्रितंवेद्र्यं शङ्ग्येलासनीइवे।
   श्रातकुभेऽष्य शङ्गं वा राजते वा सुसंस्कृते॥

Suśruta Samhitā, VI. xix.

- 4 सिद: ग्रैलासने भार्खे मेषग्रङ्गे च संख्यित:॥ Caraka Samhita, VI. xxvi.
- <sup>5</sup> विमुद्रासं तिखण्डाञ्च धातुनां काष्ठनां तथा।

  षड्डुलीस्यां गीपुच्छां नाड़ी युद्धात् दिहस्तिकां॥

  Sārngadhara Samgraha, III. ii.
- ं श्रङ्गुलि ताणकं दानां वाचे वा चतुराङ्गुलं। Astanga Hrdaya. I. XXV.

¹ "चुषणे", विष पूयाद्या चूषण निमित्तं शरीरेषु युज्यते यत्, "श्रङ्गं" गवादि भवं श्रिष्रं श्रङ्गं \* \* \* \*

Vāgbhatārtha Kaumudī, I. xxv.

#### Wood.

To apply vapour-bath, Sarngadhara mentions tubes made of wood or metal. Wooden Tubes for injections were also used.

#### STONE.

Sarngadhara says: "The collyrium probes should be made either of stone or metal". For compounding medicines, stone *khal* or mortar and pestles are mentioned. A big stone slab with a muller is recommended to be used for grinding dry or fresh vegetable medicines. In extracting the Soma juice, two slabs of stone are mentioned in the Rgveda.

#### EXECUTION.

The execution of the instruments is said to have been all that can be desired. Susruta says 5: "They should be made just of the proper size with their ends rough or polished; they should be also strong, well-shaped and capable of a firm grasp." Again he continues: "When an instrument (has been selected) of

- <sup>1</sup> नेचानि घातुनान्याहुर्नेख वंशादिनान्यपि ॥
  - Sarngadhara Samgraha, III. ix.
- नैतं कायं सुवर्णीदिधातुभिष्ठचविण्भिः। नलैई खैविषाणागैः मणिभिया विषीयते॥

Ibid, III. v.

मुखयी: कुष्टिता अच्चा श्रवाकाष्ठाङ्गुवीन्त्रिता।
 मञ्जना भातुना वा खात् क्वायपरिमण्डला॥

Ibid, III. xiii.

- 4 Rgveda. 10 Mandala, 76, 94 & 175 Süktas.
- समाहितानि यसाणि खरस्रक्षसुखानि च। सुझ्डानि सुद्धपाणि सुग्रहाणि च कारयेत्॥

Suśruta Samhita, I. vii.

a fine make and with an edge keen enough to divide the hairs on the skin, and when it has been firmly grasped at the proper place, only then it should be used in any surgical operation". And again: "A wise surgeon will get his instruments made of good iron and with sharp edges, by a blacksmith who is skilful and experienced in his craft." Vagbhata also gives the same directions.

#### ORNAMENTATION.

In the absence of actual specimen, it is impossible to say whether there was any ornamentation on the surgical instruments of the Hindus. No ornamentation is described in the extant medical treatises. Only one instrument—Mucutī—is mentioned by Vāgbhaṭa II as being ornamented with a ring.4

#### EDGES OF SHARP INSTRUMENTS.

Suśruta says\*: "The edges of instruments, used in incising

यदा सुनिश्चित' शस्त्रं रोमच्छेदि सुसंस्थित' । सुरुहोत' प्रमाणेन तदा क्रमंसु योजयेत् ॥

Ibid, I. viii.

- <sup>2</sup> See foot-note 2, P. 61.
- वड् विंग्रतिः सुकर्मारै चेटितानि यथाविषि । शस्त्राणि रोमवाहीनि वाहुल्येनाङ्गुलानि षट् ॥ सुद्धपाणि सुधाराणि सुग्रहाणि च कारयेत् । श्रकरालानि सुधातसृतीच्यावार्त्ततेऽयसि ॥ समाहितसुखागाणि नीलाभोजच्छवीनि च । नामानुगतद्वपाणि सदा सिंहितानि च ॥

Aştanga Hrdaya, I. xxv.

मुचुटी सूचा दनार्जुर्मृली रुचकभूषणा।

Ibid.

् तच्धारा भेदनानां मात्तरी। लेखनानामर्डमात्तरी। व्यथनानां विस्नावणानाच केश्विकी। क्टेदनानामर्डकेश्विकीति॥ Sufruta Sambits, I. viii,

(as of Vrddhipatra, Nakhaśastra, &c.) should be of the fineness of a masūra (Ervum Lens); of those used in scarifying (as Mandalāgra &c.) of a half a masūra; of those used in puncturing (as Kuṭhārikā) and evacuating (as needles, kuśapatra, &c.) of a hair; and those used in dividing (as Vrddhipatra), of half a hair. As to the Vadiša or hook and the Dantašanku or toothscalers, the former should have a curved end and a fine point, while the latter should have an end shaped like the first leaf of barley."

### THE TEMPERING OF SHARP INSTRUMENTS.

Susruta remarks<sup>2</sup> that "the instruments are tempered in three ways;—by immersing the heated *ŝastra* in an alkaline solution, or water, or oil. Those tempered in an alkaline solution are used in dividing bones and in excising arrows and other foreign bodies. Those tempered in water are used in incising, dividing or clearing muscles; and those tempered in oil are used in puncturing veins and dividing nerves and tendons."

As the methods of tempering the sastras are the same as those recommended for the arms of war, we quote from Vrddha Sārngadhara (the elder), two methods of tempering arrowheads and swords. He says<sup>3</sup>: "I shall describe the ways of tempering arrowheads, by smearing them with a paste of

विष्यो दन्तशङ्खानताये तीच्याकगढकप्रयम यवपतसुखे।

Suśruta Samhita, I. viii.

विषा पायना चिविधा चारीदक्ततेलिषु तच चारपायितं श्ररश्रल्यास्थिच्छेदनेषु । उदक्षपायितम् मांचच्छे दनभेदनपाटनेषु तैलपायितं सिराव्यधनसायुच्छेदनेषु ।

फलस्य पायनं वच्चे वनीविधिर्विलिपने:।
येन दुर्भेद्यवस्त्राणि भेदयेत् तदपर्थवत्।।

vegetable drugs, which would thus acquire the power of piercing a coat-of-mail as easily as the leaf of a tree."

I.

"Make a paste of Pippali (Piper Longum), rock-salt and Kustha (Saussurea Lappa) with cow's urine. These are to be well mixed until the paste becomes cold and yellow. The arrowheads and other sharp cutting instruments are to be well smeared with that paste and then heated to redness. Then they are to be removed from the furnace and allowed to cool down to a state short of redness and dipped in oil. By this means, the iron acquires special power as a cutting instrument<sup>1</sup>".

#### II.

"Make a paste of the five kinds of salts,2 mustard and honey. Let the instrument-maker smear it on the sastras which are then to be heated in a furnace. When the colours resembling those of a peacock's feather are displayed on the sastra, the burning is known to be adequate. The instrument is then dipped in water<sup>3</sup>".

- पिपाली सैस्वं कुछं गोमूतेन तु पेषयेत्। चित्रशित मनाविद्धं पीतं नष्टं तथौषधम्।। चनेन लिपयेच्छस्तं लिप्तं चाग्नौ प्रतापयेत्। तती निर्व्वापितं तैले लौहं तच विशिष्यते।।
  - भौवर्चलं सैन्धवच विड्मीक्विट्मिव च । सासुद्रेन सचैतानि पचस्तुर्लवणानि च ॥
- पश्चिमक्वियोः पिष्टं मधुसिक्तः सस्पेपैः।

  एभिः प्रलेपयेच्चस्तं लितं चायौ प्रतापयेत्।।

  श्रिखिशीबातुवर्णामं तप्तपीतं तथीषमः।

  ततस्तु विमलं तीयं पाययेच्चस्त्रमुक्तमम्॥

Vrddhya Sarngadhara.

Vaidyaka.

Vrddhya Sārngadhara.

#### III.

The sage Uṣanās or Śukrācāryya thus describes¹ the tempering of swords in the Vṛhat Samhitā (Kern's trans. Ch. L.):—

- 23. The fluid to imbrue a sword with, according to the precepts of Usanās, is: blood, if one wishes for a splendid fortune; ghee, if one is desirous to have a virtuous son; water, if one is longing for inexhaustible wealth.
- 24. An approved mixture to imbrue the sword with, in case of one desirous to attain his object by wicked means, is: milk from a mare, a camel and an elephant. A mixture of fish bile, deer-milk, horse-milk, and goat-milk, blended with toddy, will make the sword fit to cut an elephant's trunk.
- 25. A sword first rubbed with oil, and then imbrued with an unguent compounded of the milky juice of the Calotropis, goat's horn, ink, dung from doves and mice, and afterwards whetted, is fit for piercing stone.
  - वड़वीष्ट्रकरिण्डुन्धपानं
    यदिपानेन समीइतेऽर्घसिद्धिः ।
    क्रमणिण्डचगाश्च वस्तदुन्धेः
    करिइसच्छिदये सतालगर्भैः ॥
    सार्कं पयो इड़् विषाणमसीसमेतं
    पारवतास्तु प्रकृता च शैतं प्रलेपः ।
    प्रस्तस्य तैलमधितस्य ततीऽस्य पानं
    पश्चिष्टतस्य न प्रिलासु भवेदिषातः ॥
    चारे कदल्या मधितेन शुत्तै
    दिनीषिते पायितमायसं यत् ।
    सम्यक् प्रितं 'धायमिन नैति भँकं
    न चान्यसौद्धियपि तस्य कौण्डाम ॥

26. An instrument imbrued with a stale mixture of potash of plantains with butter milk, and properly whetted, will not get crooked on a stone, nor blunted on other iron instruments.

GOOD AND BAD QUALITIES OF SURGICAL INSTRUMENTS.

Susruta says<sup>1</sup>: "The good points in an instrument are the following: it should have a well-made handle, affording a firm grasp; it should be made of iron of good quality; it should have a fine edge, a pleasant shape and a well-finished point; and it should not be dentated (except the saw)." He gives preference to the Sastras which are of good make and with a fine edge—so fine as to divide the hairs on the skin and whose handles can easily be grasped by the surgeon's hand.

On the other hand, he points out eight defects<sup>2</sup> of sharp instruments: they must not be bent, or blunt, or broken, or jagged, or too thick, or too thin, or too long, or too short. Instruments free from these defects should be used. The Karapatra or saw is the only exception, for being used for sawing bones, it requires a jagged or dentated edge. Vagbhata also mentions these defects.<sup>3</sup>

Ibid.

¹ तानि सुग्रहाणि सुन्नोद्दाणि सुन्नारानि सुरुपाणि सुसमाद्दितमुखाग्रव्यकरानानि चेति
शक्तसम्पत्।
Sufruta Samhita, I. viii.

² तव वर्त्र कुण्ढं खण्डं खर्षारंमितस्त्रू जमयल्यमितिशैषमिति इसिमिय हो ग्रस्त्रदीषाः । श्रती विपरीतग्रणमाददीतात्मव करपवात्ति खर्धारमिस्टिक्टेदनार्थे।

कुष्ट-खल्ड-तनु-स्थूल-इस-दीर्घल-वक्तताः। शस्त्राणां खरधारलमष्टी दीषाः प्रकीर्तिताः॥

Aştanga Hrdaya, I. xxvi.

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Susruta enumerates twelve defects of blunt instruments, viz., it may be too thick, or made of impure metal, or too long, or too short, or incapble of being grasped, or capable of being grasped (unevenly) partially, or bent, or made of too soft material, or of elevated ends, or it may have bent, loose, elevated, and weak pins, or be of weak ends, or of thin sides. These faults refer principally to the Swastika yantras or the cruciform instruments.

## THE USES OF INSTRUMENTS.

Twenty four different kinds of operations<sup>2</sup> are said to be performed by the blunt instruments (Susruta), viz.:—

1.	Nirghātana	Extraction by moving to and					
		fro. e. q. salvanirghātanī.					

- Pūraṇa ... Filling the bladder or eyes with oil.
- 3. Bandhana ... ... Bandaging and binding by rope.
- 4. Vyūhana ... 1. Raising up and incising a part for removing a thorn or 2. bringing together the lips of the wound.
- 5. Vartana ... ... Contracting or curling up.

तचातिस्थूलमसारमितदीर्घमिति इस्तमग्राहि विषमग्राहि वक्षं श्रिष्टिलमस्युत्ततं सद्कीलं सद्मुखं सद्पाग्रमिति हादश्य सन्दिवाः।

Susruta Samhitā, I. vii.

<sup>&</sup>lt;sup>2</sup> यस्तकसंगितु निर्घातनपूरणवस्वनयूष्ट्वनवर्त्तं नचालनविवर्त्तं नविवरणपीष्ट्रनमार्ग-विद्योधनविकर्षणाष्ट्ररणाधनीद्रमनविनमनभक्षनीमाधनाचूषणेषणदारणजू करणप्रचालनप्रधमन-प्रमार्ज्ञं नानि चतुर्त्रिं श्रति:।

6. Calana ... 1. transferring, i.e., removing from one part to another; 2. moving a foreign body. 7. Vivartana ... Turning round. 8. Vivarana ... Exposing or opening out any part. Pidana ... ... Pressing as by finger to let 9. out pus from an abcess. Marga Visodhana 10. ... Clearing the canals such as the urethra, rectum &c. ... 1. Extraction by pulling; or 2. 11. Vikarsana loosening a foreign body fixed in muscles &c. Aharana ... ... Pulling out. 12. Āñcana ... ... Pulling up. 13. ... Elevating or setting upright as Unnamana 14. the depressed cranial bones or ears. ... Depression as of the elevated 15. Vinamana ends of the fractured bone. ... 1. Rubbing the head, ears &c.; Bhañjana 16. 2. contusing a part all round before it is surgically operated on. ... Probing or stirring the track Unmathana 17. formed by impacted anforeign body. ... Suction as of poisoned blood Acusana 18. and milk by horns, or gourd,

or mouth,

19.	Eşana	Exploring as by an earth-worm
	•	shaped probe, the direction of
		a sinus or the existence of a
		foreign body in the wound.
20.	Dāraņa	Splitting or dividing as the
		head, ears &c.
21.	Rjukarana	Straightening anything which
	•	is bent.
22.	Prakṣālana	Washing as a wound with
		water.
23.	Pradhamana	Blowing as powders into the
		nose through tubes.
	Duamasuiama	Rubbing out as foreign bodies
24.	$\mathbf{Pram}\mathbf{\bar{a}rjana}$	rendoring our as foreign bodies
24.	Framarjana	from the eyes &c.

Vagbhata recognises only fifteen different kinds' of operations performed by the blunt instruments: Nirghatana (moving to and fro), Unmathana (probing), Pūrana (filling up), Marga Śuddhi (clearing passages), Samvyūhana (raising up and extracting a thorn by incision), Aharana (pulling out), Bandhana (bandaging), Pīḍana (pressing), Ācūṣaṇa (suction), Unnamana (elevation), Nāmana (depression), Cāla (movement), Bhanga (breaking), Vyāvartana (turning round); and Rjukarana (straightening).

निर्घातनीनाथन पूरण मार्गग्रज्जि संव्युष्टनाष्ट्रण वन्धन पौड़नानि। भाचषणोद्रमन नामन चाल भङ्ग व्यावर्त्तनर्जुकरणानि च यन्त्रकर्मा॥

The sastras or cutting instruments, on the other hand, are said to perform eight kinds of surgical operations (Susruta).

Chedana ... ... Excision or removal of a part
of the body by operation as of piles.

Instruments:—Vṛddhipatra, nakhaśastra, mudrikā, utpalapatra, and arddhadhāra.

2. Bhedana ... ... Incision of a part, as of an abscess.

Instruments:—The same as above.

3. Lekhana ... ... Scarification or dissection of a skin-flap; or scraping, as of Rohini i.e., surgical diseases of the throat.

Instruments:—Mandalāgra and karapatra.

Vedana or Vyādhana ... Puncturing as of veins to bleed
 patients by instruments
 having fine points.

Instruments:—Kuthārikā, vrīhimukha, ārā, vetaspatra, and sūcī.

Eṣaṇa ... Probing, as of sinus and fistula
 by a probe.

Instruments:—Eṣaṇī.

6. Āharaṇa. ... Extraction, as of stone by the spoon or hook.

Instruments:--Vadiša, and danta-šanku.

¹ तद्य ग्रास्नवर्त्याऽष्टिविधं। तदाया। हिदां भेदां तीखं विस्त्रमिष्यमाद्वार्थं विस्नान्यः सीन्यनिति।
Susruta Samhitā, I. v.

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7. Viśrāvaņa ... To let out pus as from a deep-

Instruments:—Sūcī, kušapatra, ātīmukha, šarārīmukha, antarmukha, trikurccaka, and esanī.

8. Sīvana ... Stitching, as of the lips of a wound by needles.

Instruments:—The different kinds of suci or needles.

Caraka mentions, however, six kinds<sup>1</sup> of operations:—

- Patana ... Incision, as in operation for sinus, abscess, intestinal injury, and deeply impacted foreign bodies.
- 2. Vyādhana ... Tapping or piercing, as in operations for ascites, suppurating tumour, ovarion tumour, boils &c.
  - पाटनं व्यचनचैव च्छेदनं लिपनं तथा।
    प्रीच्छनं सीवनचैव षड्विधं श्रस्तकर्यं तत्॥
    नाड़ौत्रयाः पक्षशीयासया चतग्रदीदरम्।
    प्रतःश्रव्याश्च ये देशाः पाठ्यासे तिहधाश्च ये॥
    दकीदराणि संपक्षा गुव्याः ये ये च रक्तजाः।
    व्यध्याः श्रीणितरीगाश्च वीसपैपिड्कादयः॥
    छद्दवत्तान् स्यूचपर्यन्तातृत्सत्तान् कठिनान् व्रणान्।
    प्रश्रेःप्रस्त्यचीमांसं छेदनेनीप्पादयेत्॥
    किखासानि सुकुष्ठानि लिखेक्षेस्थानि बुडिमान्॥
    वातास्त्रम्थिपिड्काः सकीटा रक्तमस्ख्वाः।
    कुष्ठान्यभिद्विश्वाङ्गं श्रीयांश्च प्रच्छवित्रवक्॥
    सीव्यं कुच्यदरायन्तु गन्धीरं यहिपाटितं।
    प्रति षड्विधसृद्धिष्टं शस्त्रकर्यं मनीविभिः॥

1

	3.	Chedana	•••,	Excision, as in the operation for
		•		tumours, raised and thickened
				vraņo or corns, and piles.
	4.	Lekhana	•••	Scraping, as in operation for
				some varieties of skin
				diseases.
	5.	Pracchana	•••	Scarifying, as in the operations
				for glands, boils, leprous
				nodules, inflammatory swel-
		•		lings, &c.
	6.	Sībana •		Sewing, as in the operation of
				laparotomy for deep seated
				diseases in the abdomen.
	V=	abbata dagaribaa thi	: m+ a a a	
h.s	•	-		n kinds <sup>1</sup> of operations performed
БУ	tne	sharp instruments	<u>;—</u>	
	1.	Utpātana	•••	Raising up by incision, as by
				the Nakhasastra.
	2.	Patana	•••	Incision as by the Vrddhipatra.
	3.	Sīvana	•••	Stitching as by the Suc1.
ŕ	<b>4</b> .	Eşaņa	•••	Probing as by the Eṣaṇī.
•	5.	Lekhana	•••	Scraping as by the Mandalagra.
	6.	Pracchana	•••,	Scarification as by the Manda-
				lāgra.
	7.	Kuttana	•••	Pricking as by the Suct in
		F		" tattooing.
	8.	Chedana	•••	Excision as by the Vrddhipatra.
				·

<sup>े</sup> उत्पाद्य पाद्य सीव्येष-लेख-प्रक्रम सुद्रम् । हिदां भेदां व्यघी मन्यो यही दाहब तत्रियाः॥

9.	Bhedana	•	•••	Piercing as by	the Sharp Es	aņī.
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10. Vyadhana ... Tapping as by the Vetasapatra.

11. Manthana ... Churning as by the Khaja.

12. Grahana ... Fixing as by the Sandamsa.

13. Dahana ... Burning as by the rods.

#### WHETSTONE.

In the Rgveda we find the use of stones mentioned for whetting the edges of the arms of war.¹ The Hindu surgeons used a stone slab for sharpening the sastras or edged instruments.² It was of the colour of masa (Phaseolus Roxb.). The whetstones used by the Greeks and Romans were either the marble ointment slabs, or made of clay slate or sandy schistaceous shale.

#### INSTRUMENT CASES.

To preserve the edges of the cutting instruments, a case made of the wood of salmālī (Bombax Malabaricum) was used (Susruta).<sup>3</sup> Such cases were also manufactured of canvas, or wool, or silk, or leather. These cases—twelve anguli (i.e, fingers' breadth) long and nine anguli broad—were well sewn and

Suśruta Samhita, I. viii.

<sup>See Rgveda, Mandala.
Sükta.
Verse
, 9 , 90 , 1.
, 9 , 112 , 2.
, 10 , 53 , 9.</sup> 

<sup>,, 19 ,, 101 ,, 2.</sup> 

<sup>&</sup>lt;sup>2</sup> तेषां निमानार्थं सच्चामिला साववर्षा।

<sup>&</sup>lt;sup>3</sup> घारसंस्थापनार्थं शासाली फलकसिति।

consisted of compartments, lined with wool and seperated by partitions for each instrument. They could be folded, closed with a rod and firmly tied by a knot. The barbers of India still use similar cases for their instruments.

That the razor used to be kept in a case, we know from a passage in the Vrhadāranyaka (800 to 500 B. C.) where the author says "It (the Atman) is here all-pervading down to the tips of the nail. One does not see it any more than a razor hidden in its case or fire in its receptacle".2

स्याद्रवाङ्गुलि विसार: सुघनी दादमाङ्गुल:। चीन पद्टीर्ण कीषेय दुक्तुल सदु चर्माज:॥ विन्यस पाम: सुस्यूत: सान्त रीर्णास्य मस्त्रक:। मलाका पिह्नितास्य स मस्त्रकीय: सुसच्चय:॥

Aşţāṅga Hṛdaya, I. xxvi.

भय प्रस्नाणां सुरचनार्थं प्रस्नकीय माह स्यादिलादि । नवा कुलिविस्तारः नवा कुल परिमानविस्तारिविशिष्टः प्रस्नकीयः स्यात् । प्रस्नस्य कीयः प्रस्नकीयः । कीय चाप् इति लीकि । यथा प्रसिकीय इत्यादि । तथा स्रष्ठु, घनी, निविष्टः सुघनः तथा द्याद्याङ्गुलः देव्यंण द्याद्याङ्गुल परिमानः, तथा चीमादिजः । तथा विन्यसः यथा क्रमेण क्रतः पायो यस्य स विन्यसापायः । तथा सुष्ठु, स्तृतः क्षत सेवनः, सुस्यूतः तथा सान्तराणि सव्यवधानानि, फर्णास्थानि मेषादिलीममध्येखितानि, प्रस्नानि यिद्यान् स सान्तरीणांख्यप्रस्नः । तथा प्रश्लाकायाः पिष्टितं स्थातं चास्यं मुखं यस्य स प्रलाकापिष्टितास्य तथा सुष्ठु सचयी, नापित भाष्टिकवद्राधीकरणं यस्य स सुसचयः । चीमं चतसीस्त्रभववस्त्रं केन्विस् ख्यातः । दुकूल्याव्दः पद्यदिक्ताः स्त्रिक्ताः स्त्राः स्त्राः स्त्राः चार्ते प्रस्तिः स्त्राः चीणं दुकूलंवनात् इत्याख्य वस्त्रादि । कीषेयदुकूलं कोषकार-कीटभव सुन्नेण रिप्रम् इति ख्यातेन निर्मितं वस्तं ।

Vāgbhaṭārtha Kaumudī.

<sup>&</sup>lt;sup>2</sup> Vrhadāraņyaka, I. iv.

Macdonell's Sanskrit Literature, p. 22.

To prove that portable cases for medicaments and instruments were in use in ancient India, we quote in toto from the Mohāvāgga some references to them.<sup>1</sup>

# Boxes for Ointments, Ointment Pots, and Portable Cases.

Now at that time, the Bhikkhus used to put pulverised ointments into pots and saucers. They became sprinkled over with herb-powder and dust.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a box for ointment".

Now at that time the Khabbaggiya Bhikkhus used to carry about various kinds of boxes for ointments—gold ones and silver ones. People were annoyed, murmured and became angry, saying, "Like those who still live in the world."

They told this thing to the Blessed One.

"Various kinds of boxes for ointments, gold ones, and silver ones, are not, O Bhikkhus, to be used. Whosoever does so, is guilty of a dukkata offence. I allow, O Bhikkhus, the use of such boxes made of bone, or ivory, or horn, or of the nala reed, or of bambu, or of wood, or of lac, or of the shells of fruit, or of bronze, or of the centre of the chank-shell (Sankhu-navi)."

2. Now at that time the boxes of ointment had no lid. (The ointment) was sprinkled over with herb-powder and dust.

They told this thing to the Blessed One.

<sup>&</sup>lt;sup>1</sup> Mohāvāgga vl. 12. (Sacred Books of the East).

"I allow you, O Bhikkhus, the use of a lid."

The lid used to fall off.

"I allow, O Bhikkhus, to fasten the lid with thread and tie it on to the box."

The boxes used to fall.

"I allow you, O Bhikkhus, to sew the boxes on with thread".

3. Now at that time the Bhikkhus used to rub ointment on with their fingers, and the eyes were hurt.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a stick or holder to put the ointment on with".

Now at that time the Khabbaggiya Bhikkhus used to keep various kinds of ointment-sticks—gold ones, and silver ones. People were annoyed, murmured, and became angry, saying, "Like those who still live in the world".

They told this thing to the Blessed One.

"Various kinds of ointment-holders, O Bhikkhus, are not to be used. Whosoever does so, is guilty of a dukkata offence. I allow, O Bhikkhus, the use of ointment-holders of bone, or of ivory, or of horn, or of the nala reed, or of bambu, or of wood, or of lac, or of fruit, or of bronze, or of the chank-shell."

4. Now at that time the ointment-sticks used to fall on the ground and become rough.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a case for the ointmentsticks". Now at that time the Bhikkhus used to carry the ointmentboxes and ointment-sticks about in their hands.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a bag to put the ointmentbox in."

They had no shoulder strap.

"I allow you, O Bhikkhus, the use of a shoulder strap (by which to carry the ointment-box), or of a thread (by which to sew or tie it on)."

13.

1. Now at that time the venerable Pilindavakkha had head-ache.

"I allow, O Bhikkhus, the use of a little oil on the head".

(The disease) became no better.

"I allow, O Bhikkhus, the practice of taking up (medicine) through the nose". (See commentary on the Dhammapada, pp. 83.)

The nose ran.

"I allow, O Bhikkhus, the use of a nose-spoon" (Natthu-karanî).

Now at that time the Khabbaggiya Bhikkhus had various kinds of nose-spoons—made of gold, and of silver. People were annoyed, murmured, and became angry, saying, "Like those who still live in the world."

They told this thing to the Blessed One.

"Various kinds of nose-spoons, O Bhikkhus, are not to be used. Whosoever does so, is guilty of dukkata offence. I allow, O Bhikkhus, the use of such nose-spoons made of bone, (&c., as in chap, 12, 1, down to:) the chank-shell.

2. The nose took up the medicament in unequal proportions.

"I allow, O Bhikkhus, the use of a double nose-spoon (yamaka-natthu-karanî)."

They used to spread the drugs on a wick before they sniffed up the aroma: and their throats got burnt.

'I allow, O Bhikkhus, the use of a pipe to conduct the aroma.'

Now at that time the Khabbaggiya Bhikkhus had various kinds of pipes (&c., as in the last clauses of  $\S 1$ , down to the end).

Now at that time the aroma-pipes came open: and worms got in.

'I allow, O Bhikkhus, the use of a lid to the pipes.'

Now at that time the Bhikkhus carried the pipes about in their hands.

I allow, O Bhikkhus, the use of a bag to carry the aromapipes in'.

The aroma-pipes rubbed against one another.

I allow, O Bhikkhus, the use of a double bag.'

They had no shoulder strap.

'I allow, O Bhikkhus, the use of a shoulder strap (by which to carry the double bag), or of a thread (by which to sew it on)

#### OPERATION TABLE.

In the examination for piles, Susruta directs the patient to lie down on his bed or on a board1; and in describing the operation, Vagbhata II mentions a board to be used as an operationtable.2 A similar bed, as long as the distance from the top of the head to the knees of the patient, is also mentioned in the discription of the lithotomy operation.3 The use of a board as a fracture bed is also advised.

For passing the tubes of the vasti-yantra or clysters into the urethra in the male, the patient is recommended to sit on a stool as high as his knees (jānumātrāsana).4

In phlebotomy, the patient is advised to sit on a stool, an aratni high<sup>5</sup> (i.e. the distance between the tip of the olecranon process of the ulna to the tip of the little finger).

Suśruta Samhita, IV. vi.

ग्रचिं क्रतखल्यनं भुक्तवित्सवमव्यथम्। . मयने फलके वान्यनरोसाङ्गे व्यापियतम्॥

Astānga Hrdaya, VI. viii.

4 स्नातसा भूत्रभक्तसा रसेन प्यसापि वा। स्टिविस्वविषय पीठे जातुसमे सदी।।

Caraka Samhitā, VIII. ix.

तच व्यवसिरं पुरुषं प्रवादिव्यमुखमरिवमाची किते उपवेष्यासने। Suśruta Samhitā, III. viii. चित्रतापातपिखद्यो जानुचासनसंस्थित: ।

**चदुपद्यात्रविभानी जानुस्थापितवर्पूर: ॥** 

Aştanga Hrdaya, I. xxvii.

<sup>&</sup>lt;sup>1</sup> भुत्तवनसुपवेश्य सम्भेते श्रचौ देशे साधारणे व्यभे काले समे फलके श्यायां वा प्रत्यादित्य-गुद्रमत्यस्रोत्सक्षे निषसपूर्वकायमुत्तानं \*

<sup>&</sup>lt;sup>8</sup> तती वलवन्तमविक्षवमाजानुसमि फलके प्रागुपवेष्य पुरवञ्च तस्त्रीतसङ्गे निवसपूर्व्यकाय-मुत्तानमुत्रतकटीकं । Susruta Samhita, IV. vii.

# KAPĀTA-ŚAYANA OR FRACTURE-BED.

n the treatment of fractures of the lower extremities, ion is made of the kapāta-śayana (lit. door-bed) or 11re-bed, consisting of a plank of wood resembling the panel oor. The patient is to lie down on it. The board has five rods to it, to which the fractured limb is tied to prevent any 11ment: two on each side of the joint and one on the plantar ce of the foot. Dallana explains it thus 12: In fractures of 12 nones of the leg, two rods are fixed on each side of the ankle one supports the foot; in fracture of the thigh bone, two are fixed on each side of the knee or hip, and one under foot. In a double fracture of the thigh bone and bones of the

Suśruta Samhita, IV. iii.

<sup>2</sup> जङ्गोर्भङ्गेषु पञ्चात कर्म्मविश्रेष' निर्द्धिश्वाह। भय जङ्गेत्यादि। जङ्गोर्भयु-दिविधानामपौत्यपरे। तिसितमाच्च । भग्नानाम काण्डभग्नानाम। कपाटशयनमवश्य र म। चलनम कपाट शयनेनैव सह देशान्तरनयनार्थम्। त्राधारभूतश्यनचालनार्ध-ये। प्राधेयभूतश्ररीरावयवचलन परिहाराधें कीलाः। कीलानां पश्चरख्यालम्। व्वीर्देशीरेकतरस्य भग्नमवेद्ध तव जङ्गाभग्ने तु गुल्फसन्वेरुभयती दौ एकस तली एवं पञ्च। मग्रे जानसम्बद्भयती ही ही। वङ्गासम्बद्भयतत्त्व चैक इत्यवापि पञ्च। ा तु सप्तिभिरेव की लैंग्रेन्तणम्। तथाइ उभयती विस्त्री गुल्फयोदी च जानुनी: दी च ह्यो: तली चैक एवं सप्त। अब जड़ीव्वीं: पार्श्वयोव्वीं ही तली चैक्स कीलक इति कैचित् त्। तन्निवन्यकारैर्न पठितम्। तस्रान्न पठनीयम्। गयदासस्यात पाठान्तरं किमपि ते। तशाभावात्र लिखितम्।

Dallana's Commentary, IV. iii.

भण जङ्गीरसमानां कपाटण्यनं हितं। कीलका वस्त्रनार्थच पच कार्या विजनता। यथा न चलनं तस्य भग्नस्य क्रियते तथा। सस्तेरसयती हो हो तले चेकच कीलकः। श्रीखां वा पृष्ठवंग्रे वा वचस्यचकयोस्रथा। भग्रसन्धिविनोचेषु विधिननं समाचरित्॥

leg, seven rods are required,—two on the outer side of the ankle, knee, and groin, respectively, and one under the foot. The fracture-bed is recommended to be similarly availed of infractures and dislocations of the loin, the spinal column, the chest, and the clavicle. And this mode of treatment, he adds, may advantageously be used for the other kinds of fractures and dislocations. Vagbhata II also mentions it in the treatment of fractures.

Hippocrates used a similar fracture-bed for the proper treatment of fractures and dislocations. It was called Scammum Hippocratic or bench of Hippocrates. As the figures of of this bench would elucidate the structure of the kapāta-ŝayana, we reproduce here three plates with their explanations given at the end of Vol. II, Genuine Works of Hippocrates (Syed. Soc. Ed.), and two plates—Scammum Hippocratis and Plinthium Nilcii from the Collection De chirurgiens Grees.

Fig. 1. The Scammum Hippocratis or Bench of Hippocrates, as represented by Andreas a Cruce (Officina chirrugica venetiis, 1596).

Fig. 2. The same as represented by M. Littré.

A. A board, 6 cubits long, 2 broad and 12 inches thick; not 13 as incorrectly stated by M. Littré.

B. The feet of the Axles, which are short.

Aşţānga Hridya, VI. xxvii.

कटो जङ्घोरुअग्रामां कपाटययमं हितम्। यन्त्रवाये तथा कीलाः पञ्च कार्य्या विवन्धनाः॥ जङ्घोर्वोः पार्ययोजीं ही तल एकस्य कीलकः। स्रोखां वा प्रष्ठवंग्रे वा वक्तस्याचकयोक्षया॥

- CC. Axle-trees.
- DD. Grooves 3 inches deep, 3 broad, seperated from one another by 4 inches.
- E. A small post or pillar, fastened in the middle of the machine in a quadrangular hole.
  - F. Pillars a foot long.
- G. A cross-beam laid on the pillars FF, which can be placed at different heights by means of holes in the pillars.
- Fig. 3. Representation of the mode of reducing dislocation of the thigh outwards, as given by M. Littré (Œuv. d'Hipp., tom. iv, p. 305).

# A mistake in the figure given by M. Littré is here corrected.

- A. A lever applied to the nates of the luxated side, and acting from without inwards, in order to bring the head of the bone into its cavity.
- B. Another lever, held by an assistant, put into one of the grooves of the machine, and intended to act against lever A.
- C. Grove in which the end of the lever A takes its point of support.
  - D. The luxated member.
  - EE. Extension and counter-extension.
- Fig. 4. Banc d'Hippocrate, d'après Rufus, servant à réduire différentes luxations. (Collection De Chirurgiens Grecs, Bibliothèque Nationale).
- Fig. 5. Plinthium, ou cadre de Nileus, d'après Héliodore. (Ibid).

## CHAPTER IV.

THE NUMBER OF SURGICAL INSTRUMENTS.

The armamentarium of the Hindu surgeons consisted of a good number of surgical instruments. They are described to be of two kinds, the yantras and the sastras, i.e., the blunt and the sharp instruments. Susruta enumerates no less than one hundred and one varieties of the blunt instruments, and twenty different kinds of sharp instruments. Harīta, on the other hand, enumerates twelve blunt instruments, twelve instruments, and four prabandhas, as necessary for the operation of extraction of arrows and other foreign bodies.1 Vagbhata II mentions one hundred and fifteen kinds of blunt and twenty-six kinds of sharp instruments. Palakapya (Treatment of Elephants) mentions ten kinds of śastras or sharp instruments though he describes the uses of other instruments required for the surgical treatment of diseases.

Instruments and their Classification (Susruta.)

Of the one hundred and one varieties of the blunt instruments, the surgeon's hand is rightly considered as the principal instrument, for without its help, no instrument can properly be used, and every surgical operation is under its control.<sup>2</sup> They are recommended to be used for the extraction

तच मनः भरौरावाषकराणि भल्यानि तेषामाहरणीपायी यन्ताणि।

रे हादशेव तु यनाणि श्रञ्जाणि हादशेव तु । चलारि च प्रवन्धाना श्रज्ञीद्वारे विनिर्द्धित्॥

वसम्बत्मिकीत्तरसत्र इसमिव प्रधानतमं यन्त्राणामवगक्तः । विं कारणं । यसाङ्गसाहते
 वसाङ्गासामप्रक्षतिरिव तद्घीनतादान्त्रकर्याणां।

of *ŝalya* or foreign bodies, *e.g.*, a dart, an arrow, a javelin, a spear, a peg, a pin, a bamboo rod, a stake &c. which cause pain to the body and mind.

A. Suśrūta subdivides the blunt instruments into six classes, viz.:

I.	Svastika or cruciform instrum	24	kinds.	
· II.	Sandamsa or pincher-like	. •••	2	"
III.	Tāla or picklock-like		2	23
IV.	Nāḍī or tubular or hollow		20	"
. V.	Śalākā or rod or pricker-like	•••	<b>2</b> 8	"
VI.	Upayantra or accessory	•••	25	"
				-
			101	

These instruments are advised to be made generally of iron, or of other suitable materials, when iron is not available. Their ends often resemble the faces of some ferocious beasts, or of deers, or birds. Hence the instruments should be so constructed as to have the likeness of their faces, following at the same time the directions of scientific treatises, or the instructions of teachers, or in imitation of other instruments, or in adaptation to the exigencies of the time. They should be of reasonable

¹ तानि षट्प्रकाराणि । तद्यथा । खिलाकयन्ताणि । सन्दंश्यन्ताणि । तालयन्ताणि । नाड़ीयन्ताणि । श्राक्तावायन्ताणि । उपयन्ताणिचिति । तच चतुर्विश्रति खिलाकयन्ताणि । दे सन्दंश्यन्ते । दे एव तालयन्ते । दिश्रतिनीद्यः । श्रष्टविश्रतिः श्राक्ताः । पञ्जविश्रति द्यप्यन्ताणि ।

Susruta Samhitā, I. vii.

Hessler translates the terms as follows: Uncinata instrumenta, forcipum instrumenta, palmiformia instrumenta, hamata instrumenta, secundaria instrumenta.

Hessler's Susruta, I. vii.

size, with their ends rough or smooth as required. They should be of strong make, good shape and capable of a firm grasp.1

- I. The Svastika or Cruciform instruments are—
- 1. Simhamukha. 2. Vyāghramukha. 3. Vṛkamukha.
- 4. Taraksumukha. 5. Rksamukha. 6. Dvīpimukha.
- 7. Mārjāramukha. 8. Śrgālamukha. 9. Airvvūrukamukha
- 10. Kakamukha. 11. Kankamukha. 12. Kuraramukha.
- 13. Cāsamukha. 14. Bhāsamukha. 15. Śaśaghātīmukha.
- 16. Ulūkamukha. 17. Cillimukha. 18. Grdhramukha.
- 19. Syenamukha. 20. Krauńcamukha. 21. Bhrigarājamukha.
- 22. Añjalikarnamukha. 23. Avabhañjanamukha, and
- 24. Nandimukhamukha.
  - II. The Sandamsa or pincher-like instruments are—
    - Forceps with arms.
    - 2. Forceps without arms.

समाहितानि यन्त्राणि खरश्चामुखानि च। सुट्टानि सुद्धाणि सुग्रहाणि च कार्येत्॥

Suśruta Samhita, I. vii.

षनेकदपकार्थाणि यन्त्राणि विविधाग्वतः । विकलाः कल्पयेदः बुद्धाः यथास्त्रूलन्तः वन्त्यते ॥

पनी हान्यनुशस्त्राणि तान्येवस्व विकल्पयेत्। भपराण्यापि यन्तादीन्यपयोगस्य यौगिकस्॥

Aştanga Hrdaya, I. xxv.

¹ तानि प्रायमो जी हानि भवन्ति तत्प्रतिकपकाणि वा तदलाभे । तत्र नानाप्रकाराचां व्यालानां स्वापित्वणां मुखेर्मुं खानि यन्त्राणां प्रायम: सहमानि तस्मात्तत्साकप्यादागमादुप-दिम्रादन्यसद्भैनाद्यक्तित्व कारयेत्।

#### The Tala or picklock-like instruments are— 1. Ekatāla. 2 Dwitzla IV. The Nadi or tubular instruments are-For fistula-ih-ano ... (1) with one slit; (2) with 2 slits ... 2 For piles ... (1) with one slit; (2) with 2 slits ... 2 For wounds For clysters (Rectal) ... (Some authors describe 3 only) ... 4 For clysters (vaginal and urethral)... (male and female) ... 3 For Hydrocele ... 1 For Ascites ... 1 For fumigation and inhalation ... 3 For Urethral Stricture ... 1 For Rectal ... 1 For Cupping—gourd ... 1 20 The Salaka or rod-shaped instruments are— Gandupadamukha or earth-worm like Sarapuńkhamukha or arrow-stem like ... 2 Sarpafanamukha or snake's hood like ... 2 Vadišamukha or fish-hook like ... 2. Masūradalamukha or masūra pulse like ... 2 ... Promārjana or swabs ... · 6 . . . Khallamukha or spoons Jamvavavadana or jambul seed like ... 3 Ankušavadana or goad like ... 3 Kolāsthidalamukha or plum seed like ... 1 Mukulagra or bud shaped ... 1

Malatīpuspavrntāgra or like the stem of malatī flower

1

- VI. The Upayantra or accessory instruments are-
- 1. Rajju—thread. 2. Venikā—twine. 3. Paṭṭa—bandages.
  4. Carma—leather. 5. Valkala—bark of trees. 6. Latā—creepers. 7. Vastra—cloth. 8. Aṣṭhīlāśma—stone or pebble.
  9. Mudgara—hammer. 10. Pāṇipādatala—palm of the hand and sole of the foot. 11. Aṅguli—finger. 12. Jihvā—tongue. i3. Danta—tooth. 14. Nakha—nail. 15. Mukha—mouth. 16. Vāla—hair. 17. Aśvakaṭaka—the ring of a horse's bridle. 18. Śākhā—branch of a tree. 19. Sṭhīvana—spittle. 20. Pravāhaṇa—fluxing the patient. 21. Harṣa—objects exciting happiness. 22. Ayaṣkānta—a loadstone. 23. Kṣāra—caustic. 24. Agni—fire. 25. Bheṣaja—medicines.
  - B. The sharp instruments or sastras are—
  - 1. Mandalagra or round headed knife.
  - 2. Karapatra or saw (lit. like the human hand).
  - Vṛddhipatra (lit. like the leaf of vṛddhi—an unknown medicinal plant)—a razor.
  - 4. Nakha-sastra or nail-parer.
  - 5. Mudrikā or finger-knife (like the last phalanx of the index finger).
  - 6. Utpalapatra, a knife, *i.e.*, resembling the petal of a blue lotus, (Nymphaea stellata., Willd).
  - 7. Arddhadhāra or a single-edged knife.
  - 8. Sūcī—needles.
  - Kusapatra—a knife shaped like the kusa grass (Eragostris Cynosuroides).

- 10. Ātīmukha—a knife shaped like the beak of the Ātī
  bird (Turdus Ginginianus).
- 11. Sararī-mukha—a pair of scissors like the beaks of Sararī bird.
- Antarmukha (lit. having internal sharp edge)—a kind of scissors.
- 13. Trikurccaka—an instrument consisting of three needles.
- 14. Kuthārikā—a small axe shaped instrument.
- 15. Vrīhimukha—a trocar shaped like a grain of rice.
- 16. Arā or awl.
- Vetasa-patraka—an instrument shaped like the leaf of a rattan (Calamus Rotang).
- 18. Vadiša—an instrument shaped like the fish-hook.
- 19. Dantašanku or tooth-pick.
- 20. Eşani or sharp probe-like instrument.

According to Harita1 the twelve blunt instruments are—

- Godhāmukha or iguana-faced.
   Vajramukha—grdhramukha?
   Tribaktra or three faced.
   Sandamsa or pincher.
  - गोधामुखं वचमुखं चिवकृ नाम सन्दंशचकाक्षतिकङ्पादम्। अधानकं श्रःक्षकुष्डलच श्रीवत्ससीवत्सिक पञ्चवकं। द्वादशैतानि यन्ताणि कथितानि भिषम्बरै:। अध श्रस्ताणि ग्रीकानि नामानि च प्रथक् पृथक्। अर्धचन्द्रं जीद्विमुखम् कङ्पचं कुठारिका। करवीरकपचच श्रलाककरपवर्कम्। विष्क्रं ग्रम्नपादच श्र्ली च स्चिमुद्गरम्। श्रस्ताखेतानि ग्रीकानि श्रल्थोद्वारे पृथक् पृथक्॥

- 5. Cakrākṛti or circular shaped. 6. Anaka? 7. Kankapāda?
- 8. Śriga or horn. 9. Kundala? 10. Śribatsa? 11. Saūbatsika?
- 12. Pañcabaktram, i.e., five faced-simhamukham?

The twelve sharp instruments of Harita are-

- 1. Arddhacandra or half-moon shaped. 2. Vrihimukha.
- 3. Kankapatra. 4. Kuthārikā. 5. Karavīrakapatraka. 6. Šalākā or sharp probe. 7. Karapatraka or saw. 8. Vadiša or sharp hook. 9. Grdhrapāda? 10. Šūlī 11. Sūcī or needle. 12. Mudgara or hammer?

Vagbhata II classifies the instruments in the following way:-

A. Blunt instruments—				-
I. Svastika, as heron, lion, bear, crow,	deer			
forceps &c	•••		•••	24
II. Sandamsa: It consists of two	iron			
blades soldered at one end, the	other			
ends being free	•••		•••	2
(a) for extraction of eyelashes &c.	•••	1		
(b) mucuțī	•••	1		
III. Tāla	•••		•••	2
(a) Ekatāla		1		
° (b) Dwitala	•••	1		
IV. Nādī or tubular:	•••		•••	23
(a) Kanthasalyāvalokinī or throat specu	lum			
having three and five holes	• • •		2	
(b) Salyanirghātanī	•••		1	
(c) For piles, different sizes for male	and			
female	•••		G	
For inspection: 2 holes—rectal specul	uın	2		
For medication: 1 hole	•••	2		
For applying pressure: entire—sami		2		

13

	Arddhendu or half-moon shaped, for hernia					
•	Kolāsthidala f			••••	1	
	Nail-shaped	•••	•••		3	
(f)	For cleansing	•••		• • • •	_	3
	Rectum	•••	•••	• • •	1	
	Vagina	•••	•••	•••	1	
	Urethra	•••	•••	•••	1	
(g)	Collyrium prol	be .	•••	•••		1
	1.1					234

VI. Anuyantra or accessory instruments are nineteen in number. To the list of Susruta he adds the following<sup>1</sup>:—

Goat's gut, silk, time, suppuration, and fear.

B. The sharp instruments of Vāgbhaṭa are twenty-six in

number.²

1. Mandalāgra. 2. Vṛddhipatra. 3. Utpalapatra. 4. Adhyarddhadhāra. 5. Sarpāsya. 6. Eṣaṇī:—Gaṇḍūpadamukhā and Sūcīmukhā. 7. Vetasa. 8. Śarārī. 9. Trikurccaka. 10. Kuśapatra II. Ātīvadana. 12. Antarmukha and Arddhacandrānan. 13. Vrīhibaktra. 14. Kuṭhārī. 15. Kuravakasalā. 16. Aṅguliśastra. 17. Vaḍiśa. 18. Karapatra. 19. Kartarī. 20. Nakhaśastra 21. Dantalekhana. 22. Sūcī. 23. Kurcca. 24. Khaja. 25. Ārā. 26. Karṇavedhanī.

Aştānga Hrdaya. I. xxv.

षड्विंगतिः सुकर्मारै चैटितानि यथाविचि । यस्त्राणि रोमवाद्दीनि वाहुल्येनाङ्गुलानि षट्॥ सुक्रपाणि सुधाराणि सुग्रहाणि च कार्यत् । यक्तरलानि सुधात सुतीच्यावान्तंतेऽयसि ॥

Ibid. I. xxvi.

भनुयन्त्राख्ययक्तान रज्जु वस्त्राऽत्रम मुद्गरा:। पद्दान्त जिह्वा वालाय श्राखा नख मुख दिजा:॥ काल: पाक: कर: पादीभयं हर्षय तत् क्रिया:। उपायवित् प्रविभजेदालीच्य निपुर्णे घिया॥

Bhāvamiśra mentions the following blunt and sharp instruments: Eṣanī, Jāmvoustha Śalā,¹ Sūcī² and knives generally in making incisions which should be shaped like Kharjjūrapatrika, (like the leaf of Kharjjūra tree, Phœnix Sylvestris, Roxb.) Arddhacandra, Candravarga, Sūcīmukha and Abānmukha.³

Palakapya4 mentions ten kinds of sastras:—1. Vrddhipatra.

- 2. Kusapatra. 3. Mandalagra. 4. Vrīhimukha. 5. Kuṭhārī.
- 6. Vatsadanta. 7. Utpalapatra. 8. Śalākā. 9. Śūcī or needles.
- 10. Rampaka. Besides these he refers to Vadiša.

Of the blunt instruments he mentions:—Jāmvobouṣṭha—(four in number, for application of actual cauteries), Simhadamṣṭrā, Godhāmukha, Kankamukha, Kuliśamukha—(for extraction of foreign bodies), Eṣaṇī or probes (three), wound syringe, Vastiyantra, Śalākā or rods, yaṣṭhiyantra, Karkataka, Dyātūha, Makaraka (crocodile), Śārddūlamuṣṭhika (tiger's claws), Nandimukha (Turdus Ginginianus).

- ।
  एषखा गतिमन्त्रिष्य चारस्त्रानुसारिनीम्।
  स्चौं निदध्यादत्यन्ते प्रीम्नान्याग्र विनिद्धरित्॥
  Bhāva Prakāša. II. iv., Nādī Vraņādhikāra.
- भागन्तुजि भिषग्राड़ीं श्रस्त्रेणीत्कृत्य यवत:। ज्ञास्त्रीष्ठीनाग्निवर्णेन तप्तया वा श्रलाकया॥

Ibid. Bhagandarādhikāra.

गितिमन्विष्य मस्त्रेण किन्द्रात् खर्ज्यूपिविकम् । चन्द्राईं चन्द्रवर्गेश्व स्चीमुखमवाझुखम् ॥,

Ibid.

Hastī Āyūrveda, III. xxx.

## CHAPTER V.

DESCRIPTION OF THE BLUNT INSTRUMENTS.

Now we shall describe the instruments in detail. The Yantras or the blunt instruments will be considered first, and next the Sastras or the sharp instruments.

# I. The Svastika yantra or Cruciform Instruments.

The word svastika is a technical term signifying one of the twenty-four signs of the Jinas; and it can be represented by two lines crossing each other, the arms of the cross being bent at their extremities towards the same direction. these instruments may be described as cruciform. They have as a rule, a length of eighteen anguli. Their ends should be shaped like the faces of the following ferocious beasts (1 to 8), dear (9), and birds (10 to 24), and the instruments are to be called after their names.1 They are divided into two classes; the instruments of class I resemble the mouths of lion (simha) and tiger (vyagra), while class II comprises the instruments which have the likeness of the faces of birds of prey, The fulcrums of these instruments which are at the middle, are of the size of a masura (Ervum lens). The handles are either rounded off, or bent at an angle at their ends, like an elephant driver's goad—the object being afford a good grasp of the instrument by the surgeon's hands. The svastika instruments are used for the extraction of

<sup>&</sup>lt;sup>1</sup> तत्र सिवायनाखाण्ट्याङ्ख्ममाणानि सिंह्याष्ठव्यत्रव्यत्तरस्य स्वित्रीपमार्जारस्यालस्य क्वार्कातकाककङ्कुररचासभासभभवात्यकूनचिक्तिस्रोनग्रमक्रीस्वस्य स्वार्णकार्यात्म स्वननिन्द्र-मुखमुखानि मस्राक्तिभिः कौत्तेरववद्यानि मूर्विऽङ्गभवदावत्तवारङ्गाखास्थिविनष्टभक्षीद्वार-णार्थमुपदिश्यने।

foreign bodies impacted in the bones. If the foreign body is visible, extract it by the lion forceps or similar forceps of class I. If it is invisible, it should be extracted by the Heron forceps or similar forceps of class II. Of all the varieties of svastika instruments, the Heron forceps (kankamukha) is the best, for it can be easily introduced and turned in all directions, and also it grasps firmly and extracts a foreign body with ease and can be applied without any harm to all parts of the body.

#### Class I:

1. Simhamukha svastika or Lion-faced forceps:—this instrument is said to have its mouth shaped like that of a lion (Felis leo). It is the principle instrument of the class I. It is

Aştānga Hrdaya. I. xxv.

दृश्यं सिंहमुखायैस्त गूढ़ं कद्ममुखादिभि:। निर्हरेतु प्रनै: प्रस्थं प्रास्त्रयुक्तिव्यपेचया॥ विवर्त्तते साध्ववगाहते च प्रस्यं निग्टस्त्रोद्धरते च यद्मात्। यस्त्रेषतः कद्ममुखम् प्रघानं स्थानेषु सर्व्वेष्विकारि चैव॥

Suśruta Samhita I. vii.

निवर्त्तते साध्ववगाइते च गास्त्रं ग्टडीलोज्जरते च यसात्। यन्त्रेष्यतः कज्जमुखं प्रधानं स्थानेषु सर्वेष्वधिकारि यज्ञ॥

Astānga Hrdaya. I, xxv.

तुन्धानि कद्वसिंहर्चकाकादिस्गपित्वणां।

मुखैर्मुखानि यन्नाणां कुर्यात्तत् संज्ञकानि च ॥

ष्रसादशाङ्गुनयामान्यायसानि च भूरिशः।

मस्राकारपर्यन्तेः कच्छेवद्वानि कीनकैः॥

विद्यात् खिलक यन्नाणि मून्तिऽद्गुश्चनतानि च।

ते हर्दे रिस्थसंनग्न श्रन्थाइरणिनस्यते॥

curious that in modern times, the European surgeons use a pair of forceps called the Lion foreceps for holding bones firmly during operations. So the Makaramukha of Pālakapya is the Crocodile forceps.

- 2. Vyāghramukha or Tiger forceps: the mouth of this instrument is like that of a tiger (Tigris regalis).
  - 3. Vrkamukha or Wolf forceps (Canis lupus).
  - 4. Taraksumukha or Hyena forceps (Hyena striata).
  - 5. Rksamukha or Bear forceps (Ursus Americanas).
  - 6. Dwipimukha or Panther forceps (Felis pardus).
  - 7. Mārjāramukha or Cat forceps (Felis domestica).
  - 8. Śṛgālamukha or Jackal forceps (Canis aureas).
  - 9. Airbbāruka or Deer forceps (Cervus elephas).

Class II:—The birds, in imitation of whose faces the instruments of this class are made, can be identified from the following discription of their beaks:—

- Birds: 1. Raptatories: they have curved beaks hooked at the extremity.
- (a) Strigidæ...owls...strong hooked beaks bent down from base.
- (b) Vulturidæ...vultures...long straight beaks bent down at tip.
- (c) Accipetridæ...falcons, osprey and eagle...short, usually dentated beaks, hooked at the ends.
- 2. Pessaries...(a) Lanidæ...shrike...hooked and strongly serrated beak. (b) Cervidæ...crow and blue-jay...beaks strong, thick, somewhat curved anteriorly and slightly notched.
- 3. Grallatories...Heroidæ or Ardeidæ...herons and kraunca...they have long and powerful beaks with sharp hard

edges, somewhat curved at the point, rarely spoon-shaped, with long neck.

The instruments are-

- 10. Kakamukha or Crow forceps (Corvus corone).
- 11. Kankamukha or Heron forceps (Ardea cenerea).
- 12. Kuraramukha or Osprey forceps (Pandion haliactus).
- Cāsamukha or Blue-jay forceps (Garrulous or Corvus cristatus).
- 14. Bhasamukha or Eagle forceps.
- 15. Šasaghātīmukha or Hawk forceps (Nanclerus furcatus).
- 16. Ulūkamukha or Owl forceps (Strix flammea).
- 17. Cillimukha or Kite forceps (Milivus ictimus).
- 18. Syenamukha or Vulture forceps (Vulture cinercas).
- 19. Grdhramukha or Falcon forceps (Peregine falcon).
- Krauficamukha (Ardea jaculator); or Curlew (Numenius Arquatus).
- 21. Bhrúgarājamukha or Fork-tailed or Butcher-bird forceps (Lanius excubitor).
- Añjalikarṇamukha—birds not identified.
- 23. Avabhanjanamukha
- 24. Nandimukhamukha (Turdus Ginginianus).

## II. The Sandamáa or Pincher-like Forceps.

The second class of instruments—the Sandaman' or pincher-like forceps—comprises only two instruments: the forceps with and without handles. The first variety is likened

<sup>े</sup> सनियद्वीर्रिनयदय सन्दंत्री वीड्याहुची भवतव्यमांसस्यात्रात्रवन्त्रीहारचार्व-सुपदिकारे।

to forceps with arms, used by the barbers for depilating t nasal cavities, while the second variety is like the armless force used by the goldsmiths. The former consists of two arms join crosswise by a pin fixed at about their middle points, and really is a cruciform instrument but is classed here for i different use in surgery. The forceps without handles consis of two blades soldered at one end. Some commentators like t subdivide the pinchers into two classes according as their end are rough or smooth. And so Hessler translates: "Dua forcipes denticulata et non denticulata".

The sandamsas are used for the purpose of extracting foreign substances from the soft structures of the human body, such as the skin, muscles, veins, nerves, and tendons<sup>2</sup>. Generally they have a length of sixteen anguli.

Vāgbhata II mentions two other instruments as modifications of the type:—

(a) One variety has the length of six anguli. It is intended for the purpose of extracting minute foreign bodies such as thorn, hair &c. and of removing the superfluous eyelashes.

Cakrapāni also advises us to use a sandamsa for epilation, which may be called the Epilation forceps.4

Astānga Hrdaya, I. xxv.

अतिगुप्तस भल्यस सन्दंशेन समुद्धरेत ।

Hārīta Samhitā, III. lvi.

उ षड्सुलोऽन्दोस्रयी तूचा श्रुल्यो पपचाचा ॥ ८।

Aştanga Hrdaya, I. xxv.

<sup>&</sup>lt;sup>1</sup> Hessler's Suśruta. Caput vii. P. 14.

कीलवड वियुक्ताग्री सन्दंशी घीड्याङ्गुली। लकसिरास्नायुपिश्रित लग्न ग्रल्यपकर्षग्रे॥ ५॥

See foot-note 2, p. 66.

Similarly in modern times, we remove superfluous eyelselses by the Epilation forceps. Mr. Borry writes :-- "When the trichiasis is only partial, a temporary improvement is obtained by epilation. In some cases where a few eyelselses only have been left altogether, the patient may procure for himself a pair of forceps, and have the eyelselses removed whenever they cause irritation." Surgical epilation was frequently necessary for trichiasis among the Romans and a similar forceps was in use there."

In ancient times in India, the barbers used epilation forceps for pulling out grey hairs. In Makha-deva jataka, we find the following conversations between the king and his barbers:—

"Barber. There is a grey hair to be seen on your head, O King."

King. Pull it out, then, friend, and put it in my hand.

So he tore it out with golden pinchers, and placed it in the hand of the King."

(b) The second variety is known as the Mucuți instrument.\*

It is a pair of straight forceps, having no curve like that of the sandamsa. It is serrated finely at the open ends. The soldered end has a ring attached to it as ornamentation. It is recommended to be used for removing painful sloughs and proud granulations from a deep-seated abscess. It is also to be used to

<sup>&</sup>lt;sup>1</sup> Practical Ophthalmology, 1904. By G. A. Berry, M.B. P. 52.

<sup>\*</sup> Paulus Ægineta, VI. xiii. (Syd. Soc. Ed.)

Rhys David's Buddhistic jataka stories, Vol. I, pp. 187.

मुपुटी त्या दसर्वृतृति वयवश्यवा ।
 मधीर वयसंख्यां यार्थवः त्रीवितस्य य ॥

complete the operation for pterygium by removing the remnant, after it has been extirpated by the sharp instruments. • Suśruta calls it Mucundi<sup>1</sup>, and uses it to hold the pterygium after it has been raised by vadiša or hook. It must be then a smaller variety of mucuți.

A similar pair of forceps, Dr. Erichsen mentions, and says<sup>2</sup> that "for the purpose of extracting needles, thorns, splinters of wood and other foreign bodies of small size and pointed shape lying in narrow wounds, forceps with very fine but strong, well-serrated points will be found useful."

Susruta mentions bamsabidala<sup>3</sup> or bamboo forceps. It is made of a piece of bamboo rod, split longitudinally into two halves nearly to its whole extent. This is like the bamboo tongs used by the smokers in Bengal to raise glowing charcoal to the earthen bowl. It should be used to remove worms from the surface of the human body.

The sandamsa instrument may be compared with the modern dressing forceps and with the forceps still used by the goldsmiths, known as a sonna. Those with arms have their counterpart in the sadasi or a pair of pinchers, still used by the blacksmiths.

# III. Tāla Yantra or Picklock-like Instruments.

The third class of blunt instruments is called Tala-

Suśruta Samhitā, vi. xv.

प्रपाक्षं प्रेचनाणस्य विङ्गिन समाहित:। सुचुख्डार्गृन्त्र मेघावी स्चीस्वेण वा पुन:॥

<sup>&</sup>lt;sup>2</sup> Erichsen's Science and Art of Surgery, Tenth Ed. vol. I. p. 342.

ताननुतै लेनास्यक्तस्य वंश्वविद्लेनापच्रेत्।

yantra<sup>1</sup>. The word tāla "has been differently interpreted by the commentators. Bhānumatī gives the alternative reading (tālu i.e., palate) for tāla, so the instruments likely had their ends shaped like the palatine process of fish. Dallana, however, maintains that tāla means picklock, the ordinary Indian key which resembles a hook. Two of these are joined at one end, the curved ends being kept free, facing one another. The instrument would then resemble the face of a bhetuli fish. Instruments with one tāla or hook resemble one lip of the fish, and those with two tālas represent its entire face. Both Cakrapāṇi and Dallana however prefer to mean by tāla, the scale of a fish."

They have a length of twelve anguli, and are shaped like the jaws of a fish. They may be made either with a single blade (ekatāla) or with double blades (dvitāla) soldered at one end, the hooked ends being free. They are intended for the purpose of extracting foreign bodies from the ear, nose and other outer canals of the body. The ear scoop now used by the barbers of India for extracting wax from the ear is a tālayantra.

Suśruta Samhita, I. vii.

हे हादशाङ्खं मत्स्यतालुबद्देव तालके। ताल यन्न सृते कर्णनाड़ी श्रख्यापहारिणी॥

Aştanga Hrdaya Samhita, I. xxv.

Dallana's Commentary, I. vii.

<sup>&</sup>lt;sup>1</sup> वालयन्त्रे दादशाङ्गुले मत्स्यतानुबदेकतालिकतालक कर्णमासामाङ्गीश्राल्यानामाः इरणार्थे।

<sup>&</sup>lt;sup>2</sup> श्रव ताल-श्रन्टिन प्रदेश ज्ञाते। एतेन एकं तालं प्रदेशी यस्य तदेकतालं, हे ताले प्रदेशी यस्य तत् वितालकमं; एतेन मत्स्यस्य श्ल्कवत्प्रतनुमुर्खेरप्रदेशं एकताल मत्स्यस्य श्ल्कवत् प्रतनुमुर्खे रप्रदेशं एकताल मत्स्यस्थलवत् प्रतनुमुखं विप्रदेशं वितालमित्युक्तम्। परिणाइन्तु कार्णादिप्रविशी श्रेयः। श्रचे तु मत्स्यतालकवदेकतालकवितालके इति पटन्ति। व्याख्यानयन्ति च मत्स्यक्षक भेटुनिमत्स्यः, तस्य लौइनयतालकाकारं मुखं भवति श्रतसम्युखाङ्गांकारं यक्षमिकतालकः, सर्वमुखाकारं वितालकः, तालकोऽनश्रपवारकादिपाटसन्विवन्थनं लौइनयमुखाते।

For removing substances that have fallen into the meatus auditorius, Paul says: "They must therefore be extracted by an earpick, a hook, or tweezers, or by using powerful shaking of the head, while the ear is placed upon some circular board." Albucasis recommends us to use a slender forceps, which resembles the modern dissecting forceps. He also commends for the purpose a hook slightly bent, which is also mentioned by Celsus.<sup>2</sup>

# IV. The Nāḍī Yantra or Tubular Instruments.

The Nadi or tubular instruments are described to be of various kinds and to serve many purposes<sup>3</sup>. They are open either at one or both ends. These are used for the extraction of foreign substances from the natural outlets of the body. They are also recommended to be used as a diagonostic apparatus for inspection of diseases in the canals. They are the means of sucking out fluid discharges, as pus etc., from cavities and they facilitate the performances of other operations. They vary in length and diameter in proportion to the different sizes of the outer canals of the body, or according to the varieties of purposes to be served by them.

Suśruta Samhitā, I. vii.

नाड़ीयन्त्राणि ग्रिषिराख्ये कानेक मुखानि तु। स्रोतीगतानां श्रत्यानामानयानाञ्च दर्भने। क्रियाणां सुकरताय क्रूर्यादाचूषणाय च। तक्ष्मार परिणाइ देख्यं सीतीऽतुरीघतः॥ ८॥

<sup>&</sup>lt;sup>1</sup> Paulus Ægineta, Vol. II. VI. xxiv. (Syd. Soc. Ed.)

<sup>\*</sup> Celsus, VI.

<sup>&</sup>lt;sup>3</sup> माड़ी यमाखनेकप्रकाराखनेक प्रयोजनान्येकतीमुखान्युभयतीमुखानि च तानि सीती-बतश्रखीहारवार्थं रीगदर्शनार्थमाचूनवार्थं क्रियासीकार्थार्थाञ्चेति तानि स्रोतहारपरिवाहानि संवादीन परिवाहदीर्घाणि च।

The tubular instruments are used for fistula-in-ano, haemorrhoids, tumours, abscesses, injections into the rectum, vagina and urethra, hydrocele, ascites, inhalations, stricture of urethra and rectum and cupping as by gourd and horns.<sup>1</sup>

As examples of the tubular instruments, Vagbhata II.

1. Kanthasalyāvalokinī<sup>2</sup> or throat speculum.

To examine foreign substances such as a fish-bone in the throat, the instrument should have a length of ten anguli and a circumference of five anguli.

Susruta describes the extraction of a foreign body, made of lac from the throat of a patient by the following device. A heated iron probe or sound should be introduced into the throat of a patient through a tube of copper and made to touch the bit of shellac. The foreign substance would begin to dissolve or soften and so will adhere to the probe. The rod is then to be cooled by sprinkling water through the tube and the foreign body then should be drawn out steadily with it. But other kinds of foreign bodies are to be extracted from the throat by means of a rod-like instrument, one end of which is smeared with melted wax or shellac.

The use of some adhesive substance for extraction of foreign bodies accidentally introduced into the outer passages of the

भगन्दरामोऽर्व्द्रवयवस्तात्तर्वसमूचङ्गिद्वोदरभूमनिवञ्जप्रकामसिवञ्चग्रयकाधाः सान्भक्षयकाथि चीर्पारटाबस्यामः । Suéruta Samhita, I. vii.

<sup>&</sup>lt;sup>2</sup> दशकुलाईगाक्षाना, मन्द्रभव्यानलीकिनी।

Aştanga Hrdaya, I. xxv.

<sup>&</sup>lt;sup>3</sup> जातुचे सन्धासके कन्छे नाहीं प्रविद्याधितप्ताच श्रलाकां तथावगुद्ध श्रीताभिर्द्धिः परिविच न्विरीभृतमुद्धरित्। भजातुनं जनुनचूक्तिश्वा श्रवाकया पूर्वकाश्यिके । Susruta Sankhita, I, xxvii,

human body was well known to the Greeks and Romans. Paul says: "Stones and such like bodies we extract by wrapping wool round an earpick, and smearing it with turpentine-rosin, or some glutinous substance, and introducing it gently into the meatus auditorius."

#### 2. PAÑCAMUKHA AND TRIMUKHA.

To take a good hold of a four-eared arrow, a speculum having five holes (PANCAMUKHA) should be had recourse to; and for a two-eared arrow, a speculum having three holes (TRIMUKHA) would be necessary. The central hole is for the arrow, while the side holes are meant for the ears of the arrow.<sup>2</sup>

Celsus<sup>3</sup> says that when a weapon buried in the flesh has barbs too strong to be broken with forceps, they may be shielded with split writing-reeds (Calamus scriptorium), and the weapon thus withdrawn.

Paul says: "Some apply a tube round about the barbs<sup>4</sup> so that when they draw out the weapon, the flesh may not be torn by the barbs."

In modern times a snare is used instead of a tube. Dr. Erichsen<sup>5</sup> writes: "The extraction of an arrow is usually attended with little difficulty. But if barbed, special precautions have to be taken. With the view of safely effecting its removal, the snares.....have been devised."

Aştānga Hrdaya, I. xxv.

<sup>&</sup>lt;sup>1</sup> Paulus Ægineta. Vol. II. VI. xxiv. (Syd. Soc. Ed.)

नाड़ीपश्चमुखच्छिद्रा चतुष्क्वर्षस्य संग्रहि। वारङ्गस्य दिकर्णस्य चिच्छिद्रा तत् प्रमाणतः।

<sup>&</sup>lt;sup>3</sup> Celsus, vii. v.

<sup>•</sup> The Works of Paulus Ægineta. vi. lxxxvii.

<sup>&</sup>lt;sup>5</sup> The Science and Art of Surgery. Vol. I. pp. 343.

#### 3. TUBULAR INSTRUMENTS FOR INSPECTION OF ARROWS.

Again for the inspection of the arrows, various kinds of tubular instruments would be necessary, which will vary according to the shape, length, and circumference of the arrows and their cars.

#### 4. Salvanirghātanī.

The top of this tubular instrument is shaped like the disc of a lotus and is closed. The other end is open and leads to a hollow extending to a fourth part of the tube. It has a length of twelve anguli. It is useful for removing an arrow fixed deeply into the body, in different directions and thus helpling its easy extraction. For this purpose Susruta directs us to use a stone hammer.

The Salyanirghātani had its counterpart in the female part of the Impellent, mentioned by Paul, for forcing an arrowhead forwards through a part so as to extract it at the side opposite to that of its entrance. It would thus be seen that the function of the Impellent was similar to that of the Salyanirghātani; the former moved it forwards, while the latter moved the Salya side to side, the object of both being to extract the foreign substance. The Impellent would seem to have been a plain rod of metal pointed at one end (the male part) and hollowed at the other (the female part); the pointed end used to be introduced into the socket of an arrow when it possessed one, and the hollow

Aştanga lipilaya, 1 xxv.

श्वारक वर्षसम्बान नाइ देखीन्दीधत: । नाइदिवं विधावाचा द्रष्टुं अस्त्राचि चारदेत् ॥ १०॥

<sup>&</sup>lt;sup>2</sup> पश्चक्षिकया मृद्धि सहस्री शदकासुक्षा । चतुर्व श्वविरागारी अध्यनिर्वातनी मता ॥

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end was meant to fit over the tail in case where the arrow was tanged.¹ The Greeks and Romans recognised the necessity of an arrow being moved about until loosened, if it remained fixed in the bone; and Celsus² directs us to strike it with some iron instrument until it be shaken from the place where it is lodged.

#### 5. TUBULAR INSTRUMENTS FOR PILES.

According to Suśrutas these should be made either of iron, or ivory, or horn or wood. They are hollow instruments tapering at the end which should be shaped like the teat of a cow. For males, the length is four anguli, while the circumference is five anguli. In the case of females, however, the tube should be made wider, the circumference being six anguli, and longer, the length being equal to the space covered by the palm of the hand. There are two slits on the sides—one for inspection of diseases and the other to allow application of caustic and cautery to the diseased part. The slit measures three anguli in length and the pulp of the thumb in breadth. At a distance of a half anguli from the margin of the slit, is raised a circular projection, also a half anguli high.

<sup>&</sup>lt;sup>1</sup> Paulus Ægineta, VI. lxxxviii.

<sup>&</sup>lt;sup>2</sup> Celsus, VII. 5.

<sup>3</sup> तच यन लीइं दानं ग्राङ्गं वाचे वा गीसनाकारं चतुराङ्गुलायतं पञ्चाङ्गुलपरिणाइं पुं सां वड्डुलपरिणाइं नारीणां तलायतं तद्दिच्छिद्रं दर्भनार्थमेनः किद्रमेकः किद्रन्तु कर्मणि। एकदारे हि ग्रस्नचाराप्रीनामतिक्रमी न भवति। किद्रप्रमाणन्तु व्राङ्गुलायतमङ्गुष्टीदर-परिणाइं यदङ्गुलमविष्टं तस्याक्षाङ्गुलमघसादर्जाङ्गुलीं क्रितोपरिङ्गकार्थिकमेषयम्बाङ्गति-समासः।

Vāgbhaṭa¹ describes two different instruments, one for inspection and the other for medication. They both have the same length and circumference. The former has two slits on the side, while the latter has only one slit, three anguli long and the pulp of the thumb in width. The annular projection is turned upwards: the object being the prevention of sudden introduction of the instrument too far inwards.

A similar instrument without any slit on the side is called Samī<sup>2</sup>. It is advised to be used for exerting pressure over the piles by its introduction into the rectum (Vāgbhaṭa.)

Rectal speculum is mentioned by Hippocrates in his treatise on fistula<sup>3</sup> and by Paul in the treatment of piles.<sup>4</sup> It is called Calopter in contradistinction to the vaginal speculum which is called Diopter. The rectal speculum in the Naples museum is a two bladed instrument working with a hinge in the middle. In modern times, both the varieties of the speculum, tubular and valved, are in use.

For inspection and medication of piles, a tubular speculum is recommended to be used by the veterinary surgeons. In the

Aṣṭāṅga Hṛdaya Samhitā, I. xxv.

भर्मसं गीसनाकारं यत्नकं चतुरङ्गुलम्। नाह पद्माङ्गुलम् युंसां प्रमदानां षड़ङ्गुलं। दिच्छिदं दर्भने व्याधेरैकच्छिद्रन्तु कर्माणि। मध्येऽस्य चत्रङ्गुलच्छिद्रमङ्गुष्ठोदर विकृतम्। भक्षाङ्गुलोच्छितोइन्त कर्णिकञ्च तद्र्षुतः॥

<sup>&</sup>lt;sup>2</sup> श्रास्याख्यां तादगच्छिद्रं यन्त्रमर्श्रः प्रपीड्नं ॥ १३ ॥

Ibid.

<sup>3</sup> The Genuine Works of Hippocrates. (Syd. Soc. Ed.) Vol. II. P. 817.

<sup>·</sup> Paulus Ægineta, VI. lxxix.

Aśvavaidyaka, Jayadatta sūri¹ describes the instrument thus: "The surgeon should, know the instrument to have the length of six anguli. On the two sides, the wise surgeon should make two slits, three anguli long and a half anguli broad. Through an instrument with two slits, the piles of the horses should be examined. Through a speculum with one slit, the surgical operations, such as incisions &c., should be performed, after having tied the horse and making him lie down".

#### TUBULAR INSTRUMENTS FOR FISTULA-IN-ANO.

These are similar to the instruments used for the inspection and medication of piles, the only difference being the omission of the circular rings in their construction, for otherwise, the projection may rub over the sore if the speculum be introduced deeply.2

- यन पड़कुलं विद्वान् च्छिद्रं पञ्चाङ्गुलं भिषक्। अधोऽर्जाङ्गुलाविसीर्थं दैध्येगाप्यङ्गल्वयम ॥ उभयी: पार्श्वयोत्तस्य कुर्याच्छिद्रह्यं बुध:।
- अर्थेसेन तु वाइस्य दिच्छिट्रेग विस्तोकथेत ॥ एकच्छिट्रेण वै कमी क्यांच्छेदादि पूर्वकम्। पातितस्य सुवद्धस्य तुरङ्गस्य विचचणः॥

Aśvavaidyaka (Bibliotheca Indica). Liii. vs. 4, 5 and 6.

किट्रार्डं इरेदीष्ठमर्भयन्तस्य यन्त्रवित । तती भगन्दरे दबादेतदर्जेन्दु समिभं॥

Suśruta Samhitā, IV. viii.

सर्वयाऽपनयेदीष्टं किद्रादृषं भगन्दरे।

Astanga Hrdaya, I. xxv.

#### 7. TUBULAR INSTRUMENTS FOR THE NOSE.

## Nasal-Speculum.

Similar tubular instrument without ring is to be used for examination of nasal diseases as tumours and polypus. It is however shorter and thinner than the rectal speculum. Vagbhata says: "It is two anguli long and admits the index finger in its lumen. The tube has a single slit on the side."

He describes nasal tubes for introducing medicated powders into the nose as snuff. <sup>2</sup> After partially filling the tube with powders, one should blow through the empty end, the other end being put well inside the nasal cavity. Susruta also uses a tube to blow powder into the nose. <sup>3</sup> Caraka <sup>4</sup> mentions nasal insufflation to cure diseases. Sarngadhara <sup>5</sup> and Cakradatta <sup>6</sup> describe the nasal tube for insufflation to be six anguli long and open at both ends.

- े प्राचार्न्यूदार्थसामिवच्छिदा नाबादम् लाब्या । प्रदेशिनी परिचाका स्याहनन्दर यक्तवत् ॥ १५ ॥ Aufänga Hiclaya, I. xxv.
- भागं विरेचन यूची युक्तात् तं सुखवायुना । पङ्गुलविसुखया नाया भिण्जमभेवा ।

Ibid. I. xx.

- <sup>5</sup> नासाकाने श्रा**वतपूर्वसुद्धं नाद्यादेयं गीऽनगीइवतीका:**। Su**é**ruta Sanhita, VI. xxiii.
- 4 सिद्धि स्थानावनं वृष्येयां प्रथमचे कितं । Caraka Samhita, VI. xxvi.
- a वृङ्क्षा दिवस्ता या नाही पूर्णनयी धर्मत्। तीकां कीलमितलस्त्र वात: प्रथमनं दितं ॥ Sarhgadhara Sanhgraha, III viii.
- े भाषनं रेचनव्यों मुखात् तत् मुखनायुना ।

  पद्युत्त विमुख्या नाया भेषनमध्या ॥

  Cakradatta, Nasyadhikara.

Aretaeus says that a quill or reed or a wide long tube may be used for blowing powders into the pharynx. Alexander Trallianus<sup>2</sup> says that a calamus scriptorium, the joints of which have been removed, may be used as an insufflator. Oribasius<sup>3</sup> however gives the fullest description of the tube used as a nasal insufflator. "A reed slender and with a straight bore, 6 inches in length, and of such a size that it can be passed in the nares, is taken and its cavity entirely filled with medicament. The reed may be either natural or of bronze. This being placed in the nares, we propel the medicament by blowing into the other end."

In modern times, we advise our patients to do the same thing when powders are prescribed to be thrown into the nose or ears. The cylindrical shaft of the ordinary quill so cut as to be open at both ends will serve the purpose admirably. The nasal insufflator is used now for identical object.

Aretaeus<sup>4</sup> mentions a nasal syringe with a double tube. It consists of two pipes united together by an outlet so that liquid medicine may be injected into both the nasal cavities simultaneously, for injection into each nostril separately, he points out, can not be borne.

It is remarkable that in Mahāvāgga<sup>5</sup> mention is made of single and double nose-spoons. Nāthu-karaṇi (i.e., an instrument to hold up the nose, so that the medicated oil

<sup>&</sup>lt;sup>1</sup> Aretaeus, Vol. II., P. 408.

<sup>&</sup>lt;sup>2</sup> Alexander Trallianus, IV. viii.

<sup>\*</sup> Oribasius Collect, xiî.

<sup>&</sup>lt;sup>4</sup> Aretaeus, Ed. Adams, Vol. II., P. 459.

<sup>&</sup>lt;sup>5</sup> Mahāvāgga, VI. 13. 1 & 2. Sacred Books of the East.

does not run out...Ed.) and Yamaka-nāthu-karani (i.e., one that would go up both nostrils...Ed.). They are recommended to be made of gold, or silver, or bone, or ivory, or horn, or of the nala reed, or of bambu, or of wood, or of lac, or of the shells of fruit, or of chank-shell". (Sacred Books of the East).

To apply oily medicines inside the nasal cavity a cotton wick is first soaked in the oil and then it is pushed well inside the nose. It is recommended also to pour oil into the cavity through a tube, while the other cavity is pressed by a finger (Vagbhaṭa¹).

To treat a case of fracture of the nasal bones, Susruta recommends<sup>2</sup> two straight tubes open at both ends to be introduced into the nasal cavities, after putting the fractured ends in position, either lowering or elevating the raised or depressed end by a rod as required. Then bandages are to be applied. The tubes serve as splints to support the broken ends in position, while through their orifices the patient may breathe without inconvenience.

Similarly Celsus, after replacing the fractured ends in position uses oblong tents sewed round with a thin soft skin as splints into the nostrils; or a large quill smeared with gum, or artificer's glue may be applied in the same way. Paul also

Astānga Hrdaya, I. xx.

Suśruta Samhita, VI. iii.

नासापुटं पिघायेकं पर्यायेण निषेचयेत्। उणास्त भेषच्यं प्रनाद्या पिचुनाऽथवा॥

नासां सन्नां विश्वतां वा ऋज्वों क्रला म्राजाकया। पृथग् नासिकयोनाच्यो हिसुखी संप्रवेशयेत्॥ ततः पद्देन संवेष्ट्रा श्वतस्य प्रदापयेत्॥

says: "And some sew the quills of the feathers of a goose into the rags, and thus introduce them into the nose, in order that they may preserve the parts in position without obstructing the respiration; but this is unnecessary as respiration is carried on by the mouth."

Susruta also advises us to introduce these tubes into the nasal cavities during the performance of the Rhinoplastic operations.<sup>2</sup>

#### 8. THE ANGULI-TRANAKA OR FINGER-GUARD.

Vāgbhaṭa says: "It is generally made either of ivory or wood. The instrument is shaped like the teat of a cow, and is four anguli long. Two slits occur on the sides like those in the speculum for piles."

It protects the finger of the surgeon from being injured by the teeth of the patient and so helps the surgeon in opening the mouth of the patient with ease.<sup>4</sup>

In modern times, finger-guards are used for the same purposes.

Suśruta Samhitā, I. xvi.

Astānga Hrdaya, I. xxv.

तच वक्र विवती, सन्तृत सुखस्यातुरस्य सुख्यादान निमित्तं सुखं सुखकरं स्यात्। यत इदं दन्तवातात् रचित चत चक्र सुखमिति।

> Vāgbhaṭārtha Kaumudī, I. xxv. मङ्गु सिर्द नेभ्यो रचणार्थलांदङ्गु निचाणिमित नाम । Sarvāṅga Sundarī, I. xxy,

Paulus Ægineta, Vol. II. vi, xei. Syd. Soc. Ed.

सुसंहितं सम्यगयो यथावद्वाड़ीहरीनाभिसमीच्य वज्ञा । प्रोद्रस्य चैनामवचूर्णयेत्र पत्तद्वयष्टीमध्काञ्जनैस ॥

अङ्, लिचायकं दाकं वाचे वा चतुरङ्गुलम्। विच्छिद्रं गीसनाकारं तदक्रविष्ठतौमुखं॥

## 9. Joni-vraņekşaņa or Vaginal Speculum.

Vāgbhaṭa¹ describes it to be a tubular instrument, sixteen anguli long, and six anguli in circumference. It consists of four blades, attached at their bases to a ring. The tube tapers gradually, the end is free and looks like the bud of a lotus. To the four blades are soldered four rods in such a way that on pressing their free ends, which pass out of the ring, by the surgeon's hands, the tapering end of the tube would gape widely. The surgeon by regulating the pressure of his hand, may open or close the speculum to any desired extent.

Another kind of vaginal speculum used to be manufactured out of the two horns of a buffalo by dividing each into two longitudinal halves. They should be so paired that their concave surfaces would look towards one another, their ends diverging outwards. So we get a pair of bivalve speculum out of a pair of horns.

The bivalve speculum of horn mentioned above, has its modern counterpart in the pair of speculum known as Barne's or Neugebauer's speculum.

> योनित्रयेचणं मध्ये ग्रषितं षोड्याङ्गुलम्। मुद्रावद्धं चतुर्भित्तमभीज मुक्तलाननं। चतुः ग्रलाकमाकानं मूले तहिकसेन्युखे॥ १७।

> > Aşṭāṅga Hṛdaya, I. xxv.

षस्य यन्त्रस्य कत्यनायां चलारिखण्डानि तथा कार्य्याणि यथा सुद्रिकया वज्ञानि निलितानि ष पद्मसुकुलाकार सुखा, षन्तर ग्रविरा षड्ङुल परिणाइवती नाड़ी स्यात्। ततसन्मध्ये प्रत्येक खण्डसंलग्न चतसः ग्रलाकाः ष्रासुखात् सिविवेश्य ग्रलाकानामध्यभागे तथा विभीयात् यथा ग्रलाकासूल पीड़नेन यन्त्रस्य सुखं विकसेतः

Vägbhatartha Kaumudī, I. xxv.

The vaginal speculum or Diopter is mentioned by Soranus, Paul and other Greek surgeons. Paul describes its method of working as follows:- "The person using the speculum should measure with a probe the depth of the woman's vagina, lest the stalk (fistula) of the speculum being too long, it should happen that the uterus should be pressed upon. If it be ascertained that the stalk is larger than the vagina, folded compresses are to be laid on the alæ pudendi, in order that the speculum may be placed upon them. The stalk is to be introduced, having a screw at the upper part, and the speculum is to be held by the operator, but the screw is to be turned by the assistant, so that the laminæ of the stalk being separated, the vagina may be distended." The accounts given by Albucasis2 and Haly Abbas3 are similar. These instruments are described to be bivalve, trivalve or quadrivalve. A quadrivalve speculum of the Greeks is identical with the Joni-vraneksana of the Hindus; the only difference being that the former is acted by screw mechanism, while the latter is worked on the principle of the lever. Drawings of several shorts of the Greek instruments are given in the surgery of Albucasis and by Schultet.4 There are three specimens of vaginal, speculum in the Naples museum, drawings of which are given by Milne. In modern times, we use similar valvular speculum for identical purposes.

<sup>&</sup>lt;sup>1</sup> Paulus Ægineta, Vol. II. vi. lxxiii. Syd. Soc. Ed.

<sup>&</sup>lt;sup>2</sup> Albucasis, Chirrug, II. 71.

<sup>&</sup>lt;sup>3</sup> Haly Abbas, Pract. ix. 57.

Arsenal de chirrug, tab. 18.

## 10. TUBULAR INSTRUMENTS FOR WOUNDS.

Vrana-vasti or Wound-syringe.

If the wound be caused by deranged air and be very tender, especially if it forms on the lower half of the body, the vasti should be used. In diseases of the urinary organs, such as, obstruction of urine, faulty conditions of urine, impure semen, stone in the bladder and disorders of menstruation, uttara-vasti is necessary.

There are two instruments mentioned—one for application of oleaginous medicines to a sore and the other for washing a sinus with medicated lotions. Each consists of a tube and a leather bag. The tube is smooth and rounded and is shaped like a cow's tail.<sup>2</sup> It is six anguli long. The base is broad and admits a thumb, while the end is narrow and admits a pea. There is a circular projection or ring at a short distance from the end. The base is fitted tightly into a bag of thin leather.<sup>3</sup>

वातदुष्टी व्रणोयस्त क्चायत्वर्धवेदनः । अधःकाये विशेषेण तत विसिर्व्विधीयते । मृताघाते मृतदोषे ग्रक्षदोषेऽश्मरीवर्णे । तथैवार्क्तवदोषे च विस्तरणुक्तरो हितः ॥

Suśruta Samhitā, IV. i.

वालनाय नाड़ी त्रणाना सेहप्रयोगार्थ प्रचालनार्थञ्च हे यन्त्रे आह यन्त्रे द्रत्यादि नाड़ीत्रणाभ्यङ्गः चालनाय नाड़ीत्रणानामभ्यङ्गार्थ प्रचालनार्थञ्च षड़ङ्गुल षड़ङ्गुल दीर्घ, विसायन्वाक्तित विस्तिनेत्राकारि वसे गोपुच्छाकारि \* \* \* \*

Vāgbhaṭārtha Kaumudī, I. xxv.

यन्त्रेनाड़ी त्रणाभ्यङ्ग चालनाय षड्ङ्गुलि। विस्तयन्त्राक्तती मूलिऽङ्गुष्ठ कालायिके। अग्रतः किंगिके मूलि निवड्सट्चर्काणी॥ १८।

Aşţāṅga Hṛdaya Samhitā, I. xxv

To prevent the tube slipping out of the bag, an additional precaution is taken by tying a knot of thread over the leather covering the tube. For description of the bag, vide infra.

Sārngadhara<sup>1</sup> however says that the tube should have the thickness of the shaft of a vulture's feather and should admit a moong (Phaseelus Moong). It is eight anguli long.

Pālakāpya describes the tube for washing wounds of elephants to be made of copper, and shaped like the karontaka flower. It is sixteen anguli long.

In modern times, wound syringes are similarly used to wash the sore with medicated lotions.

For description of the tubes for vrana-dhupana or woundfumigation, vide infra.

#### 11. Tubular Instruments for Ascites.

Dākodara yantra or Canula.

It may be either metallic or manufactured from the cylindrical hollow calamus of a peacock's feather.<sup>2</sup> The tube is open at both ends and is of the same calibre throughout. Susruta advises us to use a pipe of tin, or lead or a feather to drain the fluid, after the abdomen has been tapped.<sup>3</sup>

Śārngadhara Samgraha, III. vi. .

Aştānga Hrdaya Samhitā, I. xxv.

Suśruta Samhitā, IV. xiv

त्रणवसेख् नेत्रं स्थात् स्रच्णमष्टाङ्गुलीिखनतम् ।
 सुङ्गिच्चद्ररप्धपचनिकापरिचाहि च ।

विद्वारा निलंका पिच्छनिलका वा दाकोदरे। १-१।

उत्व तप्रादीनामन्यतमस्य नाङ्गीहिह्नारां पचनाङ्गीं वा संयोज्या दोषोदक-भवसिचेत्ततो नाङ्गीमपद्वत्य तैललवियोनामन्य त्रणवस्थेनोयचरित्।

Celsus describes a lead or copper canula for draining ascites. <sup>1</sup> Paul writes that the tip used to be bevelled off like a writing pen. <sup>2</sup> It was also employed in empyema. <sup>3</sup> Albucasis <sup>4</sup> mentions a tube of silver or copper or brass having a small hole at the bottom and three on its sides.

In modern times we use a metallic canula of similar shape for draining fluid in ascites.

#### 12. TUBULAR INSTRUMENTS FOR HYDROCELE.

This is practically the same instrument described above. Susruta<sup>5</sup> mentions a tube or canula to drain the fluid after tapping the hydrocele with the vrīhimukha sastra or trocar. The Greek surgeons did not describe the operation. They preferred the open incision to puncture.<sup>6</sup> Rhases, however, describes the operation of puncturing the scrotum for hydrocele.<sup>7</sup>

#### 13. Tubular Instruments for Urethral Stricture.

Susruta recommends gradual mechanical dilatation of the urethraby means of tubes made of iron, or wood, or lac, well-smeared

Suśruta Samhita, IV. xix.

<sup>&</sup>lt;sup>1</sup> Celsus, vii. 15 &. ii. 10.

<sup>&</sup>lt;sup>2</sup> Paulus Ægineta, Vol. II. VI. L. Syd. Soc. Ed.

<sup>&</sup>lt;sup>3</sup> Hippocrates, ii. 259.

Albucasis, Chirrug, ii. 54.

मूतजां स्वेद्धिलातु वस्त्रपट्टेन वेष्टयेत् ॥
 सेवन्या: पार्श्वतोऽधस्ता दिध्येद्वीहिसुखेन च ।
 अथात दिसुखां नाड़ीं दला विस्नावयेद भिषक् ॥

Paulus Ægineta, VI. lxii.

<sup>7</sup> Rhases, Cont. xxiv.

with ghee. He advises us to use the same tube for three consecutive days, then another of larger calibre for three days more, and so on, till the canal be fully dilated. He reserves External Urethrotomy as a last resource. 2

#### 14. TUBULAR INSTRUMENTS FOR RECTAL STRICTURE.

Suśruta similarly describes gradual dilatation of stricture of the rectum, using a higher number of diliators after the lapse of three days until the desired effect is attained.<sup>3</sup>

2 (a) निरुद्धप्रकारि नाड़ीं लीडीसुभयतोसुखीं॥
दादवी वा जतुक्ततां ष्टताभ्यक्तां प्रवेश्य्येत्।
परिषेक वसामज्ज शिग्रसारवराइयो:॥
चक्रतैलं तथायोज्यं वातन्नप्रव्यसंयुतं।
वाहाक्त्राइत् स्यूलतरां सम्यङ्नाड़ीं प्रवेश्य्येत्॥
स्रोतोविवर्षयेदेवं खिग्धमन्नस्य भोजयेत्।
भिलावा सेवनों सुक्कां सदा:चतवदाचरेत्॥

Suśruta Samhitā, IV. xx.

(b) निरुष प्रकाशे नाड़ीं हिशुखीम् कनकादिजम्। चिग्रामका चुत्रुकादिखेडेन परिषेचयेत्। तैंखेन वा वचदारुक्षकोः सिद्धेन च त्राहात्॥ पुनः स्थूलतरा नाड़ीदेया स्रोतोविवद्वये।

··· • • त्रज्ञगुदैऽम्येष क्रियाक्रमः॥

Cakradatta, Kşudraroga Cikitsā. See also Yogaratnākara, P. 368, where these verses are quoted.

 $^2$  See I (a). पंस्पार्थ :— सेवनीं त्यक्का ग्रस्त्रेण वा मूत्रस्रोत: संकोचकारण चर्म विदारयेत्। तस्यापि हारस्याविपाटे मणिशारमप्ये वं दारयेदिति।

Commentary of Srī Kantha in Vyākhyā Kusumāvalī (Anandāsram Series), P. 406.

<sup>3</sup> सन्निरुद्ध गुद्दे योज्या निरुद्धप्रकाशक्रिया॥

Suśruta Samhitā, IV. xx.

There is no mention of solid bladder sounds in the Sanskrit medical books. But from the above descriptions, it seems beyond doubt that they had a set of dilators for stricture of the urethra and another set of dilators for stricture of the rectum. These dilators were tubes—either metallic or wooden—and had a regular gradation in the increse of their diameters. Cakrapāṇī mentions stricture dilators of gold.<sup>1</sup>

In modern times we have also two sets of these instruments—urethral and rectal dilators, numbered in an ascending series according to the increased diameters of these instruments.

15. Tubular Instruments for Injections into the Rectum.

Vasti yantra or Rectal Clyster.

Injections into the rectum are to be thrown by means of a tube with a membranous bag tied to its end. The tube is advised to be made either of gold, or silver, or lead, or copper, or brass, or bell-metal, or ivory, or horns, or glass, or precious stones, or wood or bamboo. It should be clean, smooth, strong, and tapering like a cow's tail, and should terminate in a smooth rounded bulb. The tube varies in length and circumference according to the age of the patient as follows:—

I. Caraka.<sup>2</sup>

,	Age.	Length of tube.	Opening at the end admits.		
	6 years	6 anguli	A moong		
	12 ,,	8 ,,	A pea		
	20 ,, and over	12 ,,	A small plum seed		

<sup>&</sup>lt;sup>1</sup> See foot note I (b), Page 124.

भ सुवर्षेक्षयचपुतासरीति कांस्यायसास्थिद्धमवेणुदन्तै: । नलिविंषार्णैर्मीणभित्र तेस्तै: कार्य्याणि नेवाणि सक्तर्णिकानि ॥

# II. Suśruta.<sup>1</sup>

Age.		Length of tube.		Part of tube in bag.		Circumference of tube.		Circumference at end.	Measure of injection.	
	•	6 8 16 12	anguli	1½ 2 3½ 3	anguli ,, ,,	Little 4th 3rd Pulp of	finger " " thumb	Shaft of heron's feather. Shaft of falcon's feather. Shaft of peacock's feather. Admits a plum	4 8	añjali " "
70	) "˙	Same as that of the 16th year.					stone,			

षड् हादशाष्टाङ्गुल सिस्तानि षड् विंशतिहादश्वर्षजानृाम् । स्युमुद्गक्तंन्यु सतीनवाहिष्किद्राणि वर्त्यापिहितानि चापि ॥ यथावयोऽङ्गुष्ठ कनिष्ठकास्यां सूलाययो: स्यु: परिणाहवित्तः । स्युनि गोपुष्कसमाज्ञतीनि:श्रचानि च स्युगृंडिकासुखानि ॥ स्यात् कणि केकाय चतुर्थभागे सूलायिते विक्त निवन्धने हे । जारद्भवोमाहिषहारिणो वा स्याक्तीकरो विक्तरजस्य वापि ॥ हृदसनुनैष्टशिरो विगन्धः कषायरक्तः सुस्टटः सुग्रहः । त्रुणां वयोवीचा यथानृह्मं नेवेषु योज्यस्तु सुवहस्तः ॥

Caraka Samhitā, VIII. iii.

Also quoted in Cakradatta, Anuvasanādhikāra.

1 तत सावत्सरिकाष्टिदए वर्षाणां षड्टदशाङ्गुल प्रमाणानि कनिष्ठिकानामिका मध्यमाङ्गुलि परिणाज्ञान्यग्रेऽध्यज्ञीङ्गुलाई टतीयाङ्गुल सन्निविष्ट कर्षिकानि कञ्चास्येत वर्ष्टिपच नाडीतुल्य प्रविशानि सुद्गमाषकलायमात स्रोतांसि विदध्यान्ने चाणि तेषु लास्थापनाद्रव्य प्रमाणमातुर
इल्लसम्बिनेन प्रस्तेन सम्बिती प्रस्ती हीचलारोऽष्टी विधेया:।

भवति चाच।

वर्षोत्तरेषु नेवाणां विस्तानसा चैव हि । वयोवलपरीराणि समीचा वर्डेयहिचि ॥

पश्चिमियेक् इं दारशङ्गलं मूर्त ङ्गुष्टोदर परिणाहमये किनिष्ठकोदर परिणाहमये त्राङ्गलं सिविष्ट कियंकं ग्रियम्बनाङौतुल्य प्रवेशं कोलास्थिमानं क्छिद्रं क्षित्रकलायमानं क्छिद्रमित्येके । सर्ज्ञानिमूले विज्ञिनक्षनार्थं दिकिषां कानि । आस्थापन द्रव्य प्रमाणं तु विहिता द्वाद्य प्रस्ताः। समितेसूर्वं नेव प्रमाणमेतदेवद्रव्य प्रमाणन् द्विरष्ठवर्षवत्।

तत्र नेवाश्वि सुवर्षे रजततासयोरीति दलग्दश्चमियत्वसारम्यानि स्रचानि हटानि मीपुष्साकृतीन्यज्ञानि गृद्धानि । वस्रयासाम्बानां स्टवी नाति वहसा हटाः प्रमाणवन्ती मीमहिषवराहाजीरसायां।

III. Vāgbhata II.1

Age. (years).	Length of tube.	Opening at base admits.	Opening at end admits.		
Under 1 .1 to 6 7 to 11 12 to 15 16 to 20 over 20			A moong (phaseolus moong). A masha (phaseolous Rox). A kalāya (pea) (pinus sativum). Boiled pea. A śṛgalakoli (zizyphis cenoplia). h and size of the patient; but need not be wider.		

नेवलामे हितनाड़ी नलवंशास्त्रि सम्भवा।
वलाजामे हितं चर्मां सूचां वा तान्तवं घनम्॥
विस्तं निरूपदिग्धन्तु ग्रुडं सुपरिमाजितं।
स्वत्रनुद्धत हीनञ्च सुइं:स्रे हिवमिर्द्धितं।
नेवमूली प्रतिष्ठाण्य न्युजन्तु विव्ञताननम्॥
Subrata Samhitā, IV. xxxv.

<sup>1</sup> तयीम्त नेत हिमादि धातु दार्व्वऽस्थि वेनुज । गोपुच्छाकारमच्छिद्रं सुचार्ज् गुड़िका सुखं॥ जनेऽब्दे पञ्चपूर्वेऽसिवासप्तभ्योऽङ्खानि षट्। सप्तमी सप्त तान्यष्टी दादशे घोड़शे नव । हादशैव परं विंशाद वीचा वर्णान्तरेषु च। वयो वल श्रीराणि प्रमाणमभिवद्वयेत्॥ साङ्ग प्टेन सममूले स्थीख्येनाये कनिष्ठया॥ पूर्णें उन्दे ऽङ्गुल मादाय तदर्जाई प्रविधतं। नाइ लं परमं किट्रं मूलिऽये वहते तु यत्। मुद्गं माषं कलायन्तु स्विन्नं कर्कन्यकं क्रमात्॥ मुल च्छिद्र प्रमागीन प्रान्ते घटित कर्णि क'। वर्त्यांग पिहितं मूले यथास्वं द्वाङ्गुलान्तरं। किषीका दितयं नेते कुर्यात् तच च योजयेत्॥ श्रजावि महिषादीनां विल' सुरुदितं हट'। कषाय रतां निच्छिद्र ग्रन्थि गन्ध शिरं तन्।। गथितं साधुसूत्रेण सुखं संस्थाप्य भेषजं। बस्त्राऽभाविऽङ्गपादं वा न्यसिहासीऽयवा घनं ॥ Aşṭāṅga Hṛdaya Samhitā, I. xix. Cakradatta<sup>1</sup>, Śārṅgadhara and Bhāva Miśra<sup>2</sup> follow Caraka as regards measurement. Kharanāda<sup>3</sup> also gives a similar description.

- <sup>1</sup> See foot note 2, Page 125.
- <sup>2</sup> नेत्रं कार्यं सवर्णादिधात्भिवचविणभि:। नलैईन्तैर्विषासाग्रैभंशिभिर्वा विधीयते ॥ एकवर्णात षड्वर्षं यावन्यानं षड्झ्लम् । तती दादशकं यावन्मानं स्यादष्टसंमितम् ॥ ततः परं द्वादशभिरङ्गुरीने चदीर्घता। सुद्राक्टिद्रं कलायामं किद्रं कोलास्थिसन्निभम्।। गोपुच्छ सन्निभं मूली स्थूलं तस्मात् क्रमात् क्रशं। यथासंख्यं भवेत्रेवं सुन्तां गोपुन्छ सन्निभम ॥ त्रातुराङ्गुष्ठमानेन मूले स्यूलं विधीयते। कनीष्ठिकापरीणाइमग्रे च गुटिका सुखे।। तन्मूली कार्णिके हे च कार्ये भागाचतुर्धकात । योजयेत् तत वस्तिञ्च वन्धदयविधानतः ॥ चगाजग्करगवां महिषस्यापि वा भवेत। भूनकोशसा विलिख्त तदलाभे च चर्माणः ॥ कषायरकः: सुम्द्रवितः: सिग्धो हटोहित: । व्रणवस्तेसु नेवं स्त्रात् स्वत्तामष्टाङ्ग्लोन्मितम ॥ सुद्गिष्ट्रग्टभ्रपचनलिकापरिणाहि च।

Šārngadhara Samgraha, III. v. Bhāva Prakāśa, I. ii.

विश्वनिवस्तु ग्रक्षं सदृत्तङ्गुलिकासुखम्। भवेद्गोपुच्छसंस्थानं सुप्रवाहं विकणिकम्। या विभागप्रणयने मर्यादा कणिका भवेत्। दे कणिके चोपरिष्टादक्तप्रधारेऽथवान्तरे। साङ्गुष्टकपरीणाहं मूलं नेतस्य शस्यते। मध्यं तनामिकातुळ्यम्यं तुळ्यकनिष्ठिकं। स्वेनाङ्गुलि प्रमाणेन दैधे स्वाद् दादशाङ्गुलम्। कर्कन्यप्रवहच्छिद्रं श्रेष्ठमन्यदाथावयः। Hārīta<sup>1</sup> advises us to use a bamboo tube four anguli long, which is to be introduced into the rectum up to two anguli.

As a general rule, Caraka writes that the broad and the narrow ends of the tube are to be equal to the patient's thumb and little finger respectively, in circumference. The orifice at the end of the tube is to be kept closed by a wick, so that no foreign body may enter the lumen of the tube to occlude it. The plug may be easily removed when the tube is required for use, and then replaced.

Towards the narrow end of the tube is a projection or ring at a distance of about two anguli from the extremity. The height of the projection varies with the size of the tube at the base. It acts as a bar to the further introduction of the tube inside the rectum than required. Towards the base are two similar projections, two anguli apart from each other. To the one near the base is firmly tied the leather bag, so that the tube may not slip away suddenly during forcible compression of the bag. The other is meant to afford a firm grasp by the surgeon, so that the tube may not move during its introduction into the rectum. These projections are to be made of thread or a piece of cloth and are to be so shaped as to resemble the end of the proboscis of an elephant.

As regards the leather bags, they are recommended to be

# विंग्रहादशष्ड्वर्षे हादशाष्ठषड्ङ्कः इंडलम्। कर्कन्धूक सतीनायसुखं विद्रवहम्॥

Kharaṇāda quoted in Sarvānga Sundarī, I. xix.

¹ चतुरङ्गुलां विश्वमयों नाड़ीं प्रतिलच्चण कला लया विश्वप्रतिकर्मा कुचात्। \* \* \*
गुराध्यन्तरे द्वाङ्गलमात नाड़ी सञ्चारयेत् सुधीं:।

Hārīta Samhitā, V. iii.

made of the bladder of cows, or buffaloes, or hogs, or goats, or lambs. The bladder is to be well cleaned first with lime and water, so that no unpleasant smell may be emitted by the decomposition of its muscular tissue, then dyed red with Manjistha (Rubia Cordifoliatum) or with Haritaki (Terminalia Chebula, Retz.) and thoroughly dried. The bags are recommended to be soft, durable, entire and capacious. If the bladders of these animals are not available, the bags are to be manufactured from a frog's skin, or the peritoneum (one-fourth part would suffice) of any beast, or a piece of leather or a piece of very thick cloth. The size of the bag varies according to the age of the patient. It is to be firmly tied over the first projection at the base of the tube.

In the Siddhisthana Chapter XI of the Caraka Sainhita, there is a passage showing that veterniary medicine was well-known to the ancient Hindus at a very early period. This portion was edited by Drdhavala and it is impossible to decide whether the passage refers to Agnivesatantra or not. It runs as follows:—
"Then the disciples asked: 'How are clysters to be made in cases of animals such as elephants, camels, cows, horses, lambs and goats?' To this, the sage Ātreya explained the clysters for

Caraka Samhitā, VIII. xi.

भग्रक्टरेनं सचवित्तमन्त्रवीत् विधिश्वतस्याह पुन: प्रचोदित: । श्रजाविकसीस्य गजोष्ट्रयोवां गवाश्रयोवित्तसुश्रान्तिमाहिषम् ॥ श्रजाविकादनसुवित्तसुत्तरं वदन्ति विद्यां विपरीतद्वपम् । सुवित्तमण्डदशशोष्ट्रशाङ्गलं तथैवनेवश्व दश्याङ्गलं न्नमात् ॥ गजोष्ट्रगोऽश्वाव्यजवित्त सन्धी चतुर्धभागे च सक्तिर्णकं वदित् । प्रस्थस्त्वजात्योर्षि निदृष्टमाता मवाद्यिषु विनिगुणो यथा वल्तम् । निदृष्ट उष्ट्यः तथादक्षद्वयं गजस्य इद्धिस्तनुवासनेऽष्टमः ॥

animals in the following manner. The leather bag of the vastiyantra should be made of a buffalo's bladder for goats, lambs, elephants, cows, camels and horses. The vasti for these animals is known as suvasti and uttara-vasti as uttara-suvasti. The tube of the suvasti should be eighteen anguli long for elephants and camels, sixteen anguli for cows and horses, and ten anguli for goats and lambs. Like the vasti yantra used for men, it should have a projection at the junction (of the tube with the bladder) and another at the fourth division of the tube from the end."

In the Aśvavaidyaka¹ the tube for the horse is thus described: "The tube should be made either of wood, or metals, or horn, or bamboo, or reeds. Its length should be twelve anguli and circumference six anguli. The wise surgeon should make the tube of such a calibre as to allow a plum seed to pass through it easily. It should be straight, polished and tapering from the base. At a distance of four anguli from the end of the tube, a projection should be raised, while for tying the leather bag firmly to the tube, two projections ought to be constructed at the base".

Pālakāpya<sup>2</sup> describes the rectal clysters for elephants. He advises that these are to be made either of wood or bamboo. The end is bulbous and the surface smooth. The length

Aśvavaidyaka, XVI. vs. 2-4.

<sup>&</sup>lt;sup>2</sup> Pālakāpya's Hasti-Āyurveda, Sec. IV. Ch. V.

length of the tube varies, the most convenient being sixteen anguli for men and sixty-eight anguli for elephants. The projections at the base of the tube should be twelve anguli high. He describes in detail the method of introduction, position of the elephant, etc.

Drdhavala advises us to reject the following eight kinds of tubes and eight kinds of bags<sup>1</sup>:—

#### I. Tubes—

- 1. Hrasva or too short: For the injection does not reach the proper place.
- 2. Dirgha or too long: For the injection passes beyond the proper place.
- 3. Tanu or too thin: The injection can not pass through the tube easily and so the bag may burst.
- 4. Sthula or too thick: The tube pulls the mucous membrane of the rectum and anus backwards and forwards during its entrance and exit.
- Jīrṇa or old, weak and delicate: The tube may break inside the rectum during its introduction and so cause injury to the gut or anus.

Caraka Samhitā, VIII. v.

इस्तं दीघं तनुस्यूलं जीयं शिथिलवन्धनम्। पार्त्वं च्छिद्रं तथा वक्रमष्टी नेताणि वर्ज्जग्रेत्॥ अप्राप्तारितगतिचोभकषेणचणनस्रवाः। गुदपीड़ा गतिर्जिद्या तेषां दोषा यथाक्रमम्॥ मासलच्छिद्रविषमस्यूलजालकवातलाः। छित्रः क्रित्रस्य तानष्टी वस्तीन् कर्मस् वर्ज्जग्रेत्॥ गतिवैषस्यविस्रत्वस्राव्यदीयाद्यनिस्तवाः। फेनिलच्यतथाय्यैलं वस्तेः स्याद् वस्तिदोषतः॥

- 6. Sithilabandhana: The tubes do not fit the bags well, so during compression of the bags, the injected fluid runs out by the side of the tube.
- Pārsvacchidra or leaky: Having slit on the side, the tube may injure the soft parts by rubbing against them.
- 8. Bakra or curved: The motion of the injected fluid would be curvilinear. It will strike a side of the rectum and so would not go inside the gut.

#### II. Bags—

- 1. Mamsala or fleshy: The bag emits bad smell.
- 2. Chidra or leaky: The injection escapes outside.
- 3. Visama or uneven: Parts are unequally compressed and so the injection does not issue in a forcible jet.
- Sthula or thick: It is deficult to grasp the bag and so it can not be forcibly compressed.
- 5. Jālaka or having a network: The injection comes out.
- 6. Vātala or hollow, airy and incompressible: If air can not be expelled out, froth forms in the injection; and so air is pumped into the rectum.
- 7. Chinna or torn: The injection flows down.
- 8. Klinna or moist: The injection can not be forced-out.

Susruta mentions eleven defects of tubes and five defects of bags of the Vasti yantra.

Suśruta Samhitā, IV, xxx v.

ऋजुनेव' विघेय' स्थात्तव सम्यग्विजानता। श्रतिस्थले कर्केशे च नेवे चावनते तथा॥

<sup>े</sup> श्रतिस्थुलं कर्कशमवनतमण्यभित्रं सिन्नक्रष्ट विप्रक्रष्ट कर्णिकं सूच्यातिष्किद्रमितिदीर्घ-मित्रहस्त्रमित्येकादश् नेवदीषाः। वहलताल्यता सिक्क्ट्रिता प्रसीर्णता दुर्व्विद्वतिति पश्चवित्त दोषाः।

	•
1. 2.	hes— Atisthūla: Too thick. Such tubes injure the rec- Karkaśa: Rough. Avanata: Curved.
	Anu: Too thin.  Bhinna: Broken.  Sannikr ta Karnika: Projection near?  It becomes useless to inject fluids into the rectum.
, <b>7.</b>	Viprakṛṣṭa Karnika: Projection distant? Injure the rectum which bleeds.
8. 9.	Sūkṣma: Small orifice. It becomes difficult to inject Atihrasva: Too short. as the fluid comes out.
10.	Atichidra: Large orifice. Too much fluid passes into the rectum and so pain is
11.	Atidirgha: Too long. ) complained of.
II. B	ags—
1. 2,	Vahalatā: Fleshy. It is difficult to tie the bags Prastīrṇatā: Large. over the tubes properly.
3.	Sacchidratā: Perforated. \( \) No fluid can be forced into the rectum and so
4.	Durvviddhatā: Difficult to the instrument is use-

चासन वर्णिन नेत्रे भिनेऽणी वाष्यपार्थं कः ॥
चनसेको भवेडसेसस्यादोषािन्वर्क्ययेत् ।
प्रक्रष्ट कर्णिने रक्तं गुदमस्यं प्रपीष्ट्रमात् ॥
चरत्यत्रापि पित्तम्नो विधिवस्यि पिष्क्रिलः ।
इस्तेलस्योतसि च क्रो यो वस्तिय पूर्ववत् ॥
प्रत्यागर्क्यतः क्रार्थोद्रोगान्वस्ति विधातजान् ।
दिर्पे महास्रोतसि च न्नेयमत्यवपीष्ट्रवत् ॥
प्रसीर्णे वहले चापि वस्ती दुर्वेड दीषवत् ।
वस्तावत्येऽस्तता वापि द्रव्यस्यास्यगुना मताः ॥

दुर्वे हे चाण भिन्ने च विश्वेय: भिन्न नेतवत्।

5. Alpatā: Small. Small quantity of fluid passes into the rectum.

गुद्दे भवेत् चतं कत् च साधनं पूर्व्यत्त स्मृतं।

Suśruta Samhitā, IV. xxxvi.

### 16. UTTARA-VASTI.

Urethral, Vaginal and Uterine Tubes.

Injections into the urethra and vagina are also recommended to be thrown in by similar contrivances: the tubes being adopted in length and circumference to the length and breadth of the passages for which they are intended.

#### 1. Tubular Instruments for the Urethra.

The tubes intended for applying medicines into the male urethra is recommended to be twelve anguli long. Suśruta¹ advises us to use tubes fourteen anguli long. It is to be made of gold and is called Puspanetra. Its circumference is equal to that of a stalk of flower of Jātī (Jasmimum Grandiflorum) or Mālatī (Echites Crayophyllata, Rox.), and the lumen of the tube allows a mustard seed to pass through it. It is provided with an annular projection just at the central part. Caraka² says that

Suśruta Samhitä, IV. xxxvii.

विशेष चाइनां विश्व वच्यान्यतः परं ॥ चतुर्द्दशाङ्गुलं नेवमातुराङ्गुलं सम्मितम् ॥ मालतीपुष्पवन्तायं किद्रं सर्पप निर्गमम् ॥ मेद्रायामसमं विचिदिच्छन्ति खलु तिहदः । केष्ठ प्रमाणं परमं कुश्वश्वाव प्रकीत्तितः ॥ पश्चविश्यादधोमावां विद्ध्याद बुद्धिकल्पिताम् । निविष्टकर्णिकं मध्ये नारीणां चतुरङ्गुलं ॥ मृतस्रोतः परीणाहं सुद्ग वा हि दशाङ्गुलं । तासामपत्यमार्गे तु निदध्याञ्चतुरङ्गुलम् ॥ ब्राङ्गुलं मृत्वमार्गेतु कन्यानाग्त्विकमङ्गलम् । विशेषं चाङ्गुलं तासां विधिषवच्चति यथा ॥

पुष्पनेवच्च हैमं स्थात मूक्त्रमौत्तरविस्तिकम् ।

it has two projections while Vāgbhata¹ describes three. The bag is to be made of goat's bladder. A probe is first passed into the urethra to examine its condition and then the tube is introduced up to the length of six anguli. The bladder which contains the injection and which is tied tightly round the tube, is then compressed to force the fluid into the urethra. The tube of course, varies in size according to the dimensions of the organs of generation.

For the female, the puspanetra is described to have the length of ten anguli. The projection is at a distance of four anguli from the base. The circumference of the tube varies according to the width of the urethral canal. The calibre of the tube allows a moong to pass through it.<sup>2</sup>

जातीपुषस्य वृन्तेन समं गोपुच्छसंस्थितम् । रीप्यं वा सर्वपच्छिद्रं द्विकर्षे द्वादशाङ्गलम् ॥ ४९ ॥ Caraka Samhitā, VIII. ix.

शत्राङ्गुलमानिन तन्ने तं बादशाङ्गुलं। वत्तं गोपुच्छवत् मूल मध्ययोः क्रत कर्षािकं। सिद्धार्थक प्रवेशागं सच्चां हिमादि सम्भवं। कुन्दाश्वमार सुमनः पुष्पवन्तोपमं दृदं। तस्य विसर्ण्य दुलघुर्मावा ग्रक्तिविकल्पा वा॥ \* नेतं दशाङ्गुलं सुद्गप्रवेशचतुरङ्गुलं। स्रप्तयमागं योज्यं स्याद्मङ्गुलं स्तवर्त्मानि॥ स्तकच्चविकारिषु वालाना स्तेकमङ्गुलम्।

Aştānga Hrdaya Samhitā, I. xix.

प्रथमेत प्रमायन्तु प्रमदानां दशाङ्गुलम् । सूत्रस्रोत: परीयाहं सूत्रस्रोतोऽनुवाहि च ॥ गर्भमागं तु नारीयां विषयं चतुरङ्गुलम् । द्वारङ्गलं सूत्रमागं तु वालाया स्त्रे कमङ्गुलम् ॥

Caraka Samhita, VIII, ix

#### Catheters.

It is curious to find no description of so important an instrument as the catheter. Injections were thrown into the urethra but the tube used was always a straight one, having the length of six anguli; so it could not possibly have reached the bladder in the male, and nowhere has the claim been put forward for it to have done so. The tube might have served well for the females. The female catheter of the Greeks, as preserved in the Naples museum, is 0.98 mm. long and is straight throughout (Milne).

In the Atharvaveda Samhitā, however, we find a hymn, unmistakably alluding to the use of catheter in ancient times.

Against obstruction of urine with a rod.

"This hymn is intended to be 'used in a rite for regulating the flow of urine'. The reed implies some primitive form of a fistual urinaria, the vastiyantra (one of the nādīyantrāni) of the late physicians—who however do not appear to have made frequent uses of it".

- \* \* \* \* \* \*
- 6. What in thine entrails, thy (two) groins, what in thy bladder has flowed together—so be thy urine released, out of thee with a splash! all of it. (In the groin are two vessels located in the two sides affording access to the receptacle of urine).
- 7. I split up thy urinator, like the weir of a tank—so be thy urine released, out of thee, with a splash! all of it.
  - 8. Unfastened (be) thy bladder orific, like that of a water-

<sup>&</sup>lt;sup>1</sup> Book 1. 3. Whitney's translations and annotations.

holding sea-so be thy urine released, out of thee, with a splash! all of it.

9. As the arrow flew forth, let loose from the how,—so be thy urine released, out of thee with a splash! all of it".

#### 2. Tubular Instruments for the Vagina.

Similarly injections were thrown into the vagina. The vaginal tube should be thicker than the urethral tube and in circumference should be equal to that of the little finger. It should be introduced into the vaginal canal up to a distance of four anguli, whereas into the urethra, the tube was allowed to enter up to a distance of two anguli only in the adults and of one anguli only in the girls. 1

## 3. The Uterine Tubes.

The uttara-vasti comprises the urethral syringe—male and female—and the vaginal and uterine clysters. No distinct uterine tube is described in the text books. But Susruta<sup>2</sup> says

Šārogadhara Samhitā, III. vii. Bhāva Prakāśa, I. ii.

चर्डुजान्वे स्त्रिये ददादुत्तानाये विच्चणः। कत्यतरस्य कर्याये ददात् सुम्रदु पौड़ितं। विक्विषिकेन नेवेन ददाद्योनिसुखं प्रति। गर्भाणय विग्रुजार्थं स्नेष्टेन हिगुणेन तु। अप्रत्यागच्छति भिषक् वस्तावुत्तरसंज्ञिते।

वादशाङ्गुलकं नेतं मध्ये च क्षतक्षियंकम्। मालतिपुष्यक्षमाभिक्छद्रं सर्षपिनर्गमम्॥ \* \* \* \* स्त्रीयां किनिष्टिकास्थूलं नेतं कुर्व्याद्द्याङ्गुलम्। सुद्गप्रवेश्यं योज्यस्त्र योग्यन्त्रयुत्रङ्गुलम्॥ द्राङ्गुलं मृतमार्गे च स्त्यं नेतं नियोजयेत्। स्वक्षस्रुविकारेषु वालानामिकमङ्गुलम्॥

that to apply uttara-vasti to a female, she is advised to lie supine, keeping her knees flexed and well raised. For a girl the quantity of injection is one prasta.

To purify the uterine cavity, apply a clyster of twice the quantity of oleaginous medicines, inside the vagina by means of a tube having three rings. If after the application, the oily medicine does not flow out, then apply a second clyster containing medicines of the group called sodhana or purifiers, into the rectum; or let the clever surgeon introduce a probe into the space of the clyster; or press under her navel deeply by his closed fist. As the object of the injection is to clean the cavity of the uterus, there can be no doubt that a uterine tube is referred to in the passage. Again the precautions recommended if the injections do not come back easily, point to a uterine tube to have been used, for injections into the vagina can not be delayed in coming out. The Hindu writers often confounded the intrauterine and urethral injections with the vaginal clyster. Caraka1 says: "The uttra-vasti is to be used for the females during the period of menstruction, for then the uterus, being in a condition fit for impregnation, has its mouth open and so can easily be reached by the injection." This shows that uterine medication to be the object aimed at by the clyster.

भूयो विक्तं विद्ध्यातु संयुक्तं शौधनैभैगै:।
गुद्दे विक्तं निद्ध्याद्वा शोधनद्रव्य संख्ता।
प्रवेशाद्वा मितमान्वसिद्दारमधैषणीम्।
पौड्येद्वाययोनाभेवैलिनोत्तरसृष्टिना।

Suśruta Samhitā, IV. xxxvii

चित्रीणाचार्तवकाले तुप्रतिकर्मा तदाचरेत्। गर्भासना सुखं से इंतदाद ते द्यपालता॥ गर्भ योनिस्तदा शीष्ठ जिते स्टक्नाति माक्ति॥

Caraka Samhitā, VIII. iz.

The Greeks were no better, for Milne also complains: "It is dificult to separate ancient descriptions of injections into the vagina from those into the uterus, for the terms for the two parts are frequently interchangeable". Again he says: "It is probable that at other times under the heading of 'injections of the bladder', only irrigation of the urethra is meant". 1

#### 18. TUBULAR INSTRUMENTS FOR INHALATIONS AND FUMIGATIONS.

The tubes for smoking were made, like the vasti tubes, of various metals, or glass or wood. Caraka2 describes it as a straight tube having three pouches. The end of the tube is equal in diameter to that of a plum seed. Sārigadhara's adds that a revel or bamboo pipe will also serve the purpose. It is described as a straight tube, the broad base of which admits the patient's thum!, while the narrow end, a plum seed. Susruta 4 describes the base

Caraka Samhita, I. v.

ै धूमनाड़ी भवेत्तव विखख्डा च विपर्विका ॥१० कनौष्ठिका परीणाचा राजमावागमान्तरा। भूमनाड़ी भवेदीर्घा शमने रोगिगोऽङ्गुलै: ॥११ चलारिंगन्मितेसहस्याविंगहिस दी स्मृता। तौका चतुर्विश्रतिभि: कासन्ने बोड़शीन्त्रते: ॥१२ दशाङ्गुलिवीमनीय तथास्त्रादत्रणनाष्ट्रिका । कलायमच्डलम्यूला कुलत्यागमरन्युका॥ १३

Sārngadhara Samhitā, III. is.

 तद विज्ञनेतद्रव्येर्धुमनेचद्रव्याणि व्याखातानि भवन्ति। परिचाइमये कलायमातं स्रोतोमुलेऽङ्गुष्ठपरिणाचं धुमवर्त्ति प्रवेश स्रोतोऽङ्गुलान्यष्ट चत्वारिकाः घुमनेत्रस्तु कानिष्ठिका मायोक्षिः वावित्रत् सेष्ठने। चतुर्विशंतिकैरेचने। घोड्शाङ्गलं कासधे वासनीर्यः च।

<sup>&</sup>lt;sup>1</sup> Graeco-Roman Surgical Instruments, P. 107-8.

<sup>&</sup>lt;sup>2</sup> चतुर्ब्बिंग्रतिकं नेतं खङ्गलीभिविं रेचने। हातिंग्रदङ्गुलं सेहि प्रयोगे चाईमिष्यते॥ च्टज्रविकोषपालितं कोलास्यग्रमाणितम्। विश्वनित्र समद्रव्यं धूमनेत्रं प्रशस्यते ॥१६

and end of the tube to be equal in circumference to that of the thumb and little finger respectively. The orifice should allow a common pea to pass easily through the tube. Vāgbhaṭa¹ says that there are three pouches or dilatations of the tube, shaped like the half-open buds at equal distances from each other. The tube is supposed to consist of four equal parts. The first pouch is located at the end of the first part, the second and third pouches at the ends of the second and third parts respectively. Cakradatta² also describes it similarly.

Drdhabala<sup>3</sup> mentions another method of inhalation. He makes a paste of the medicines prescribed and smears it on a piece of silk cloth. This is then to be rolled round like a wick. This wick is to be dipped in ghee before use, and fire lit at one end, while the patient is to smoke it through the other end.

एते अपि कोलास्थिमात च्छिद्रे भवत:। त्रणनेत्रमष्टाङ्गलं त्रणधूपनार्थे कलायपरिमख्डनं कुलस्थवाहि स्रोत इति।

Suśruta Samhitā, IV. xl.

- े विक्त नेच सम द्रव्यं विकोषं कारयेष्टजु ।

  मृता येङ्गुष्ट कोलास्थि प्रवेशं घूमनेवकं ।

  तीच्या स्नेहन मध्येषु वीिया चत्वारि पञ्च च ।

  प्रङ्गुलीनां क्रमात् पातु: प्रमायी नाष्टकानि तत् ॥६॥

  Aştánga Hrdaya Samhitā, I. xxi.
- ऋजुनिकोषफलितं कोलास्थ्यग्रमाणितम्। वित्तिनसमद्रव्यं धूमनेवं प्रश्चाते। सार्वस्त्रांश्युत: पूर्णोइस प्रायोगिकादिषु। नेवे कासहरे तंग्रहीन: शेषे दशाङ्गुल:॥ Cakradatta, Dhumapānādhikāru.
- अपुन्हरीकं मध्यकं शार्क्ष टा समनःशिलाम् । सरिचं पिप्पलीं द्राचामेला सुरसमझरीम् ॥ काला विर्त्ते पिवेड्मं चौमचेलानुवर्त्तिताम् । घताकामनु च चौरं गुड़ोदकमधापिवा ॥

Caraka Samhitā, V1. xxii,

3 1

Both Caraka¹ and Sārngadhara² advise us to make tubes of medicines, the fumes of which are advised to be smoked in the following manner:—Powder the medicaments and make a paste; measure one karsa; take a smooth reed (Saccharum sara, Rox.) twelve anguli long. Apply the paste round the reed, for a length of eight anguli. Dry it in shade. Remove the reed, leaving a dried tube of the paste. When required for smoking, light one end of the tube with a burning wick and smoke through the other end.

Caraka<sup>3</sup> describes another inhaler, which consists of two carthen basins (soraba) placed upon each other, their edges being pasted with flour. The upper one is perforated at the centre for the reception of one end of the tube, the patient puts the other

Caraka Samhitā, I. v.

श्रविषकां प्रचिपेच सुस्रच्यां बादशाङ्ग्लास्। धूमद्रव्यस्य कल्को न लिपसाष्ठाङ्गलः स्मृतः॥ कल्कां कर्षमितं लिक्षा काया ग्रव्यच्य कारयेत्। इषिकामपनीयाथ को काक्तां वर्त्तमादरात्॥ सङ्गारैदींपितां क्रता धला नेतस्य रस्पृते। बदनेन पिवेडूमं वदनेनैव संत्यजित्॥ नासिकास्यां ततः पौला सुखेनैव वसेत् सुधीः।

Śārigadhara Samgraha, III. ix.

मधूच्छिष्टं सर्ज्ञरसं घरं सज्ज्ञकसंपुटे। क्रताधूमं पिवेच्छुङं वालंवास्नायुवागवास्॥ श्लोणाकवर्ष्टमानानां नाड़ीं ग्रुष्कांकुण्यस्य वा।

Caraka Samhitā, VI. xxi.

पिष्ट्वा लिम्पेच्हरिषीकां तां विर्त्त यवसिक्षां। मङ्गुष्ठसिक्षतां लुर्व्यादशङ्गुलसमां भिषक्॥ ग्राच्तां निगर्भां तां विर्त्ते भूमनेवार्षितां नर:। सेहातमग्रिसंडुष्टां पिवेत् प्रायोगिकीं सुखाम्॥ ६॥

end into his mouth for inhalation. The lower pot contains glowing charcoal of catechu (Accacia catechu. Linn.) wood, over which are put pills of necessary medicines. The tube is from eight to ten anguli long. This inhaler is intended for phthisical subjects. It is useful for allaying cough and exciting emesis. This instrument is called mallaka samputa or sorāba samputa or a pair of earthen basins. In such an apparatus Caraka recommends us to put powders of cow's horn, hairs, nerves and ligaments, besides other medicines. Susruta<sup>2</sup>, Vāgbhaṭa<sup>3</sup> and Cakradatta<sup>4</sup> also describe it. Sārṅgadhara<sup>5</sup> however reserves this instrument for fumigating wounds only.

The length of the pipe will vary according to the different kinds of smoking prescribed by the physician. There are five kinds of smoking narrated:—

- 1. Śamana, madhya, proyogika medium.
  - 2. Brimhana, snehana, mrdu mild
    - दशाङ्गुलोिक्मतां नाड़ीं अध्यवाष्टाङ्गुलोिक्मताम् । अरावसंपुटच्छिद्रे कला जिल्लां विचचणः ॥ वैरेचनं सुखेनैव कासवान् धुममापिवेत ।

Caraka Samhitā, VI. xxii.

े दतरबोर्व्यपेत भूमोङ्गार स्थिरे समाहिते शरावे प्रचिष्य वर्त्ति मूलक्छिद्रेणान्वेन शरावेण पिधाय तस्मिन्क्छिद्रे नेवमूलं संबोज्य भूममासेवेत् ।

Suśruta Samhitā, IV. xl.

अधात सम्पटच्छिट्रे नाड़ी न्यस्य दशाङ्गुला । अधाङ्गुला वा वज्रीण कासवान् धूनमापिवेत् ॥

Astānga Hīdaya Samhitā I, xxi.

भ्रथवा सञ्चतान् श्रात्न् क्राता मिल्लकासम्पृटे ।
 नवप्रतिख्यायवतां भूमं वैद्यः प्रयोजयेत् ॥

Cakradatta, Nāsāroga Cikitsā.

<sup>&</sup>lt;sup>5</sup> See foot-note 2. P. I45.

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- 3. Recana, śodhana, tīkṣna strong.
- 4. Kāsaghna anti-cough.
- 5. Vāmana emetic.

So the length of the tube would vary thus-

#### 1. Caraka<sup>1</sup>

1.	Caraka ·			
	In strong smoking	•••		Aṅguli. 24
	", medium ",	••••	• • •	32
	" mild ",	•••	•••	96
2.	Suśruta. <sup>2</sup>			
	In medium smoking	•••	•••	48
	" oleaginous "	•••	•••	32
	" brain-sedative "	•••	•••	$\dots$ 24
	" anti-cough or emeti	с "	•••	16
3.	Vāgbhaṭa.³			
	In strong smoking		•••	24
	" medium "	•••	•••	32
	" mild "	•••	•••	40
4.	Śārngadhara.4			
,	In medium smoking	•••		40
	" mild "			32
	"strong "	•••	•••	24
	., anti-cough ,,		•••	16
	" emetic or			
	wound-fumigation	•••	•••	10

# FUMIGATION.

Similarly wounds are said to be purified by suitable medicinal fumigation. In the purification of wounds by fumigation, we get a glimpse of the antiseptic method of treatment in its

<sup>&</sup>lt;sup>1</sup> See foot-note 2- P. 140.

<sup>3</sup> See foot-note 1. P. 141,

See foot-note 4, P. 140.

<sup>\*</sup> See foot-note 8. P. 140.

embroyonic form. Susruta¹ recommeds the tube to be eight anguli long and to have the circumference of a common pea; and its orific should be of the size of a kulattha (Dolichos biflorus, Linn.). The fumes of medicated substances from the inside of any closed pot containing fire, pass out through the tube and are allowed to play on any sore to purify it. For this purpose two earthen pots—sorāba sampuṭa—may conveniently be used as before. Śārngadhara² uses a tube ten anguli long and recommends us to use Nimba leaves (Azadirachta Indica) for woundfumigation. As another instance of the application of the principles of antiseptic methods to practical therapeutics, we may mention the use of medicinal injections into the cavity of the uterus to rectify its morbid conditions.³

A similar instrument was used to fumigate the uterus and vagina in various diseases of these parts. "Fumigation", says Suśruta, "is to be applied to the vagina by burning the

स चौमयवसिर्धिर्भिर्भुपनाङ्गेश्वधूपयेत्।

Ibid. IV. i.

दशाङ्गुलिर्वामनीय तथास्त्राद त्रणनाष्ट्रिका। कलाय मण्डलस्थूला कुलस्थागमरम्बुका ॥१३

.शरावसम्पुटे चिष्ठा कल्कमङ्गारदीपितम् ॥१७
हिद्रे नेत्रं निवेश्याय त्रणनोनेव धूपरीत्।
\*

त्रणे निम्बवचादाञ्च धूपनं संप्रशस्यते। 💂

Śārngadhara Samgraha, III. ix.

Suśruta Samhitā, III. x.

¹ व्रणनेवमष्टाङ्गुलं व्रणधूपनार्थमकलायपरिमण्डलं कुलत्यवाहिस्रोतद्रति । Suérnta Samhitā, IV. xl.

<sup>&</sup>lt;sup>3</sup> See foot note 2, P. 1318.

सभैसङ्गे तु योणि घूपयित् क्षणसर्पनिकाँकिण पिण्डीतकेनवा ।

slough of a snake (Bungarus) or pinditaka (?) wood, in cases of obstructed delivery of the fætus. Caraka¹ mentions furnication of the vagina by burning Bhurjapatra (Betula Bhojpatra). glass, precious stones and the slough of a snake as one of the means for removing the placenta. To remove the after pains micturition and difficulty in defæcation. Suśruta<sup>2</sup> advises us to fumigate the vagina. He recommends fumigation of the uterus with purifying medicines. In fumigating these parts, the Hindu surgeons desired a local action, and did not share in the belief, held by some of the Greek gynecologists3 that "the uterus was an animal within the body which could wander about. being attracted by pleasant smells and repelled by disagree-The Arabs also did not believe uterus to be an able smells",4 method of treatment was well known to the animal. This for Hippocrates<sup>5</sup> writes that "fumigation with Greeks: aromatics promotes menstruation and would be useful in many other cases, if it did not occasion heaviness of the head". He "directs us to take a vessel which holds about four gallons and fit a lid to it so that no vapour can escape from it. Pierce a hole in the lid, and into this aperture force a reed about a cubit in length so that the vapour connot escape along the outside of

Caraka Samhitā, IV. viii.

Suśruta Samhitā, III. x.

<sup>&</sup>lt;sup>1</sup> भूर्ज्जपत्रकाचमणि सर्पेनिकोंकेशास्त्रा योणि धपयेत्।

कटुकालावुक्ततविधन सर्वप सर्पनिकाँकिवा कटुतैलविनिमयेगीनिसुखं भूपयेत्।

<sup>&</sup>lt;sup>3</sup> Aretæus. Morb. Acut. ii, 11. Plato's Timeas.

Graco-Roman Surgical Instruments. P. 158.
 Adan's Commentary on Paulus Ægineta, Vol. I. Bk. ii. P. 636-37.

<sup>&</sup>lt;sup>5</sup> See also in the Hippocratic treatises, as Nat. Mul. vii, 9; 1 Morb. Mul. vii, 1; II Morb. Mul. xl. 20, 2I; Steril. vi. 3; Superfect. ix. 3, x. 9, II.

the reed. The cover is then fixed on the vessel with clay."

Oribasjus<sup>2</sup> and Soranus<sup>3</sup> used similar instruments for the purpose.

DISINFECTION OF ROOMS, CLOTHES, etc.

Caraka says that if peacock's feather, bones of vaka bird, white mustard and red sandal wood, well powdered and mixed with ghee, be used in fumigation, the poison of a room, beddings, seats and clothes, is got rid of. Sārūgadhara advises us to disinfect a sick room by the fumes caused by burning the following substances with ghee: peacock's feather, Nim leaves (Melia Azadirachta), Vrihati, pepper, asafetida, Jotámanisi (Nardostachys jotamansi), seeds of Sālmali (Bombax malabaricum), goat's hair, slough of a serpent, cat's faces and ivory. Susruta advises fumigation of a sick room for a surgical patient for

Caraka Samhan, VI. xxv.

Sårhgadhara Saingraha, 111. iz.

Sufruta Samhita, I. xix.

<sup>&</sup>lt;sup>4</sup> Graco-Roman Surgical Instruments P. 159.

<sup>2</sup> Coll. v.six.

<sup>3</sup> Sormans, xxiii.

शिक्षवर्षवलाकाम्यीति सपैदायन्दने व एतपृक्षः ।
 भूमी रुष्ट्रभयनासनवस्त्रादिषु शस्त्रते विषतुत्॥५२॥

मध्यिष्यं निम्मस्य प्रतास्य त्रवतीक्षमम् । मिरचं विष्ठुं मांसी च बीजं कार्याससभावम् ॥ कार्यामाविभिन्मीकं निष्ठा बैड्डालिकी तथा । गजदनाय तथुषं किसिड्डत विभिश्चितम् । गवेषु धूपनं दश्चं सर्वन्यालयकास्रयेत् । पिश्वाचान् गव्यासस्त्रित्य सर्वज्याक्षरेदो भवेत् ॥

सर्वपारिष्टपताभ्यां सर्विषा लवर्षन च ।
 विरम्ह कारवेड्वं दवरानमतन्द्रितः ॥

ten days, morning and evening, after the operation has been performed.

# 15. Tubular Instrument for Cupping.

Generally cow's horn is recommended for the purpose. It is eighteen anguli long, its base, forming the mouth of the instrument, is three anguli wide (Vāgbhaṭa).¹ It is conical in shape and the cone is said to be either curved or straight. The other end is pointed and perforated to the extent of allowing a mustard seed to pass through it. The narrow end, however, is made to assume the shape of a woman's nipple by winding thread round it. This facilitates the operation of suction by the mouth of a surgeon when the broad end is placed against any diseased area of the patient's body. Suśruta² mentions its use in blood-extraction. For extracting bood, the part must be scarified before its application; and to facilitate the operation, the part should be fomented (Yogaratnākara).³ After suction, the horn is to be covered by a piece of cloth or a small bladder of animals.

Vāllūki<sup>4</sup> describes the śrnga thus:—"It is the horn of a white cow, half-moon shaped and seven anguli broad. The orifice

Aşţānga Hrdaya Samhita, I. xxv.

Yogaratnākara Arbuda cikitsā.

Vällüki quoted in Nibandha Samgraha, I. xiii.

¹ तरङ्गुलासंर भवेच्छृङ्गं चूषणेऽटादशाङ्गुलं।

**<sup>े</sup> अग्रेसिडार्थकक्टिद्रं सुनन्ध**चुकाक्षति ॥

<sup>ै</sup> ततप्रिक्ति ततुवस्त्रपटलावनज्जेन धङ्गेन शोणितमवसेचयेदाचूष्रणात्। Susruta Samhitā, I. xiii,

<sup>े</sup> स्ते दं विदध्यात्त्र सत्य नाष्ट्रा ग्रङ्गेन रक्त वहुग्र: हरीह ।

विषाणः श्वेतगोरिन्ह्चक्षं सप्ताङ्गुलायतम्। चिप्तानः पिचुपेशिकं योज्य वातयुतेऽस्ति। श्रङ्गुष्टे मूलवन्त्रूले किट्रमगेऽसा सुद्ववत्।

at the base is equal in circumference to that of the base of the thumb, while the end which is perforated admits a moong. This orifice at the end is closed by a wick of cotton". Cakrapānidatta says that the horn should be three anguli long, and its orifice should be of the size of the stalk of an oleander flower.

Suśruta mentions a peculiar use of the horn<sup>1</sup>: the extraction of an insect, cerumen, etc. from the middle ear by means of a horn or a probe. The horn was evidently used as an apparatus for suction, and Suśruta describes suction as one of the methods of extracting śalya from the body<sup>2</sup>. Caraka<sup>3</sup> uses horns and leeches to extract venom from a snake-bite; and Suśruta also refers to it. Besides the horns and cupping glasses, suction used to be accomplished by the surgeon's mouth.

Similarly Paul<sup>+</sup> says that foreign bodies may be sucked out from the ears with a reed.

On the method of suction as a mode of treatment, Erichsen<sup>5</sup> says:— "In former days, when duels with the small swords were of frequent occurrence, persons called "suckers" who were often the drummers of a regiment, were employed to attend the wounded combatants. This treatment which was conducted with a certain degree of mystery, consisted in sucking the wound till all blood ceased be flow, and then applying a pellet of chewed

Suśruta Samhitā, VI. xxi.

Caraka Samhitā, VI, xxv.

म क्यांच्छिद्रे वर्षमानं कीढं क्लेदमलादि वा। प्रक्लेणापहरेजीमानयवापि शलाक्या।

<sup>&</sup>lt;sup>2</sup> See foot-note 3, P. 108.

<sup>&</sup>lt;sup>3</sup> दशं वा चुषेन्यु खेन यवचूर्णं पाग्रपूर्णेन। प्रच्छन् विधजलीकः प्रक्रेः सात्र्यं ततो रक्तम्॥

<sup>4</sup> Paul. VI. xxiv. and III. xxiii.

Erichsen's Surgery, Vol. 1, p. 341.

paper or a piece of wet linen to the orifice; in this way it would appear that many sword thursts traversing the limbs were healed in a few days. The process of suction cleared the wound thoroughly of all blood, and drawing the sides into close apposition, placed the parts in the most favourable condition possible for union by primary adhesion. This practice might, perhaps, in many cases advantageously imitated in the present day by means of a cupping glass and syringe".

We also find Suśruta¹ describing a vasti yantra in the treatment of snake-bite. The tube is open at both ends, one end is applied to the part bitten by the snake, while to the other end the surgeon puts his mouth to suck out the poison. So this vasti yantra may be compared to the modern aspiration syringe.

Cupping instruments of metal or horn are still used by the Arabs in Kordofan and Sir R. Pasha<sup>2</sup> suggests that cupping is possibly borrowed by the west from the "most perfect physicians" the Arab. But now we are confident that the credit is due to the Hindus.

#### ALĀBU YANTRA.

Alābu or gourd is described to be made of the bark of the succulent fruit called alābu (Lagenarea Vulgaris). The pulp is scraped away and the bark is allowed to dry. Such a bark should be selected which is twelve and eighteen anguli in length and circumference respectively. Its mouth should be circular and should have a diameter of three or four anguli. A fire is to be lit inside it by burning a strip of dry cloth to produce a vacuum, and the

<sup>&</sup>lt;sup>1</sup> प्रतिपूर्य मुखं वसि हितमाचूवणं भवेत्।

Suśruta Samhitā, V.v.

<sup>&</sup>lt;sup>2</sup> Vide Third Report, Wellcome research laboratory at Gordon. P. 316.

instrument to be applied instantly to the intended part of the patient's body. It should be thus used to drain blood and phlegm from the body (Vāgbhaṭa¹). In modern times cupping glasses are used for like purposes in a similar manner.

Vāllūki² describes the alābu yantra thus:—" The mouth of the instrument is well formed and has the diameter of four anguli. The body has the circumference of eight anguli and is well smeared with a paste of black mud. It is used for drawing out blood". In yogaratnākara³, śṛṅga and alābu are directed to be used for extraction of blood from accidental wounds. Caraka mentions the use of alābu for blood-extraction⁴.

Another instrument known as the ghațī yantra was used exactly in the same way<sup>5</sup>. It is said to consist of a brass pot

चतुत्रङ्गल हत्तास्रो दीतोऽनः स्रोभरतहत्॥

Aşţānga Hrdaya Samhitā, I. xxv.

श्रष्टाङ्गुलपरीणाष्टा चतुरङ्गुलनालसस्मिता सुसुखी क्रथ्यस्टालिमा ततु: श्रेष्टा रक्तावसेचनेऽलावुरिति।

Vällüki quoted in Nibandha Samgraha I. xiii.

सान्तर्दीपयाऽलाव्वा ।

Suśruta Samhitā, I. xiii.

किन्ने भिन्ने तथा विन्ने चते सद्यो भिषगवर:। पृहस्तेण संखेटं न्नणं नणविशारद:॥ सृन्तुमुंचर्यथा दु:खं ना प्राप्नोति नणी नर:। अथवा दीप्यलवणपीटख्या खेदयण्पुन्त:॥ सन्तमया तप्तलोच्याचसंयोगत: क्रमात्। दुष्टं रक्तं स्थितं चापि यङ्गलाव्यादिभिर्करेत्॥

Quoted in Yogaratnākara.

- \* इधिरागमार्थमधवा प्रक्लाविभराहरेत् रक्तम-
  - Caraka Samhitā, VI. vii.
- <sup>5</sup> तहद्घटीहिवा गुबा विलयोत्रमने च सा।

Aşţānga Hrdaya Samhitā, I. xxv.

which is still used commonly in India by all classes of people for drinking purposes. A fire should be lit inside as before and the ghatī applied to the surface of the body covered by a piece of cloth. It soon becomes firmly fixed and is thus used to raise abdominal tumours by means of it for purposes of correct diagonosis and also to effect its cure by subsidence. It is still used by the common people for the same ends.

Caraka¹ says:—"After the abdominal tumour has been relaxed or softened a little by fomentation and oleaginous application, it is to be covered by a piece of cloth. Then inside a small ghatī, a fire is to be lit by burning kuśa and other forms of grasses; the pot is then to be inverted and pressed over the part covered by the cloth. By this way, the tumour would be drawn upwards i,e. be made prominent. The ghatī is then to be taken away and after removing the cloth, and examining the extent of the tumour, it is to be incised. The different shapes of the incisions are called vimārga, ajapada and ādarśa. After incision, the tumour is to be pressed and rubbed with fingers. But the intestines and the heart must not be touched."

The extraction of blood by means of cups, has been practised from remote antiquity. It is interesting to note that both the Latin and Greek terms—cucurbitula and own signify a gourd;

Caraka Samhitä, VI. v.

चिन्धस्तित्रश्रीराय गुक्के शैथिख्यमागते॥ परिविध्य प्रदीप्तांस्तु वल्लजानथवा कुशान्। भिषक् कुम्भे समावाप्य गुक्कं घटसुखं चिपेत्॥ स ग्टहीतो यदा गुक्कसदा घटमथोद्वरेत्। वस्त्रान्तरं ततः; कला भिन्दाादृगुक्कप्रमाणवित्॥

and we know that Alābu also means a gourd. It is curious that the instrument should have been known to the ancient Hindus and Greeks by the same name.

Prosper Alpinus<sup>1</sup> (16th century) who wrote a book on the state of medicine in Egypt in his time, gives drawings of cupping horns he saw there. The horns were those of young bulls, highly polished, with a small hole at the top, by which the air was extracted by suction. To close the orifice a small tab of parchment was taken into the mouth and affixed by the tongue. The Egyptians also used cupping glasses, by suction and not by fire, a method evidently unknown to them.

Hero of Alexandria (B. C. 285—222) describes an interesting form of cup. Milne summarises his account thus:2-"The figure shows a cup of ordinary flattened form, divided into two by a diaphragm. Two tubes pass through the fundus, one passing through the diaphragm, the other not. Each of the tube is fitted with another which is open at its inner end but closed at its outer end and provided with a small cross bar to rotate it. Each of these sets of tubes is perforated by small openings. In the case of the short tubes, these are outside the cup, in the case of the long tube they are inside the cup, in the chamber shut off by the diaphragm. By rotating the piston these openings can be placed in apposition or not at will, thus forming valves. Open valve A by placing the hole in apposition. Close valve B by turning the holes away from each other. The inner chamber of the cup is now shut off except for the small hole A. Apply the mouth to the valve A, and suck the air out of the chamber. Close valve A. Apply the cup to the affected part. The advantage

<sup>&</sup>lt;sup>1</sup> De Med. Aegyptiorum. Ed. 1541 lib. ii. ch. xii. p. 139.

<sup>&</sup>lt;sup>2</sup> Græco-Roman Surgical Instruments, P. 104.

of this arrangement is that the affected part is not directly sucked upon by the mouth; and the instrument is therefore more pleasant for the operator to use".

Celsus thus describes the different kinds of cups:—"There are two kinds of cups, bronze and horn. The bronze is open at one end and closed at the other; the horn, open at one end, as in the previous case, has at the other end, a small foramen. Into the bronze kind, burning lint is placed, and then the mouth is fitted on and pressed until it sticks. The horn is placed empty on the body, and then by that part where the small foramen is, the air is exhausted by the mouth, and the cavity is closed off above with wax and it adheres in the same way as before. Either may advantageously be constructed, not only of these varieties of materials but of another substance. If other things are not to be had, a small cup or a narrow mouthed jar will answer the purpose. When it has fastened on, if the skin has previously been cut with a scalpel, it extracts blood; but if it be entire, air".

Paul<sup>2</sup> remarks that "those which are made with longer necks and broader bellies are possessed of a strong power of attraction." Both Oribasius<sup>3</sup> and Aretaeus<sup>4</sup> allude to them. Antyllus says that there are three materials of which cups are made—glass, horns, and bronze. A good number of such cups occur in the Naples, British and Scottish National Museums.

<sup>&</sup>lt;sup>1</sup> Celsus. I1. xi.

<sup>· \*</sup> Paulus Ægineta. VI. xii.

Med. Coll. VII. xvi.

<sup>\*</sup> De Morb. Acut, I. 10.

Albucasis<sup>1</sup> gives a full account of dry cupping. In applying the instrument he advises us either to create a flame in it, or to fill it with hot water. He gives drawings of various instruments of cupping. Rhases speaks of applying a glass or a cupping instrument to draw off blood after leeching. The other Arabians give little additional information.

In modern times, cupping glasses are used in the same way as before.

#### V. Šalākā or Rods.

The rods, or pricker-like instruments, or probes are described to be of various kinds and are recommended to be used for various purposes<sup>2</sup>; so their length and circumference would vary according to some special uses required of them. Susruta<sup>3</sup> says: "There are two kinds of šalākā with their ends shaped like the head of the earthworm. They are used for probing abscesses and sinuses.

Two śalākā have their ends shaped like the wing of an arrow. These are to be used for raising any part for the purpose,

नाङ्गेत्रणान् शल्यगभानुस्यार्थत्मिङ्गनः जनः।
 कशीरवालाङ्गलिभिरेषण्याः वैषदिद्विषक्।

Sušrata Sankhita, IV. i

े शन्ताकावन्ताव्यपि नाना प्रकाराणि नाना प्रधाननाति यथायांगयिकाइद्रशेषां । अन्य निषां गाव्यप्रस्ताव्यपिका विशेषास्त्रे हे हे एवण स्यूड्नभालनाइरकार्धम्पदिकां ने । अभवदल्त सातमुखं हे किश्विदाननाये जोतागत्रान्योद्वरवार्थः। षट्कापां सक्तांभीवाणि प्रभार्जन कियासः। वीणि दन्यांकृतीनि खस्त्रमुखानि भारीवभग्रविधानार्थः। वीण्यस्त्रानि जान्यवद्दनानि वीण्यस्त्रानि वहवाधिकस्त्रस्त्रामि । नामार्थुद्दरवार्थमकं कालास्थित्रसम्बन्धस्त्र खल्लातीकां ने । अन्यसार्थमेकं कलास्यपरिमन्द्रलस्यस्य स्वातिकां ने । अन्यसार्थमेकं कलास्यपरिमन्द्रलस्यस्य स्वातिकां मुक्तायां। स्वसार्थिकां स्वातिकां स्वात

Suéruta Salábitá, I. vii.

Albucasis, Chirrag, ii, 98,

after incision, of extracting any foreign body from it. Others assign to them the function of bringing together the lips of the wound caused by an abscess being opened and emptied.

Two salaka have their ends shaped like the hood of a snake. They are useful for transferring any material from one part to another. Some of the simple probes used by the ancient Greek and Roman surgeons carried a single or double snake of Æsculapius at one end. But evidently it was meant as an ornamentation and served no useful purpose.

Two śalākā have their ends shaped like a fish-hook but are blunt. They are used for extracting any extraneous material from the muscles or bones".

The last six kinds of Susruta are practically the same as the six sanku of Vāgbhaṭa, 1 which are the following:—

The sanku are six in number. Amongst these, two are twelve and sixteen anguli long respectively. They are used for the purpose of raising a foreign body upwards from the wound.

Two varieties have their ends shaped like the hood of a snake. They are ten and twelve anguli long; and they are used for the purpose of moving a foreign body in the wound in all directions.

Two varieties have the shape of a fish-hook—the ends resembling the stem of an arrow. These are used for the extraction of foreign bodies from the wound.

गद्धन: षडुभी तेषां घोड्शहादशाङ्गुली। व्यूहनेऽहि फणावक्रो ही हादश दशाङ्गुली।। चालने शरपुक्षा स्ता वाहाय्ये विद्शाक्रति:।।रप्

Susruta<sup>1</sup> mentions another pair of śalākā which have their ends shaped like a masūra pulse, and slightly curved; these are used for the purpose of extracting a foreign body from the external outlets of the body such as mouth, nose, etc. They are eight and nine anguli long respectively.

#### SWAB PROBES.

Six salākā are used for the purpose of wiping out the principal excretory canals of the body viz., rectum, nose and ears.<sup>2</sup> Their ends are covered with cotton like a head-dress (pāgḍī). The two salākā intended for the rectum, have the lengths of ten and twelve anguli respectively for short and long distances. So the two varieties of probes for the ears are eight and nine anguli long, while the other two kinds of probes for the nose are six and seven anguli long respectively. Some commentators are of opinion that these six salākā are meant for clearing abscesses.

For similar purposes the Greek and Roman surgeons used the spathomele or spatula probe. Priscianus<sup>3</sup> writes: "First of all we must frequently wipe away the clots of blood from the nose

¹ See foot note 2, P. 155.

जभेगण्ड्रपदसुखे स्रोतन्थ: शल्यहारिणी।

मस्रदलवक्को हे स्राता मष्टनवाङ्गुले।।२४

Aṣṭāṅga Ḥṛḍaya Saṃhitā. I. xxv.

वार्णास विज्ञितोणीषाः शलाकाः षद्प्रमार्जने । पायावासात्र ट्रायें हे दश हादशाङ्गुले । हे षट् सप्ताङ्गुले न्नाये हे कर्येऽप्टनवाङ्गुले ॥२८॥ Ibid.

<sup>&</sup>lt;sup>8</sup> Priscianus, xiv.

with the end of a spathomele wrapped on the 'berry' with soft wool, and then occlude it by plugging with wool in the same way."

The use of probes, having the ends wrapped with wool, for wiping out discharge of pus from the ears of horse, is mentioned by Jayadatta Suri<sup>1</sup> in his Treatment of Horses.

#### SPOON-SHAPED PROBES.

Three probes are described to have their ends shaped like a khala or mortar with a conical cavity, and so they resemble a spoon. They are to be used for the purpose of applying cau the solutions, etc.<sup>2</sup>

Similarly cyathiscomele, which is a variety of spathemele in which the spatula is replaced by a spoon, is said to have been used by the Greek surgeons to mix, measure and apply medicaments. The specimens of these instruments occur in the Naples Museum. Sometimes the edge of the spoon is sharp and is recommended to be used as a curette. Scrivonius Largus directs us to use the spoon of an ear specillum for the application of causties to hamorrhoids.

पूयस्रविख जानीयात् श्रोधमभ्यन्तरीङ्गम् ।. पित्तुना वेष्टियत्वा तु श्लाकार्यं समाहित: ॥ तेन कर्णान्तरे पूर्यं कर्षियत्वा विश्वच्यः । पातितस्य सुवद्धस्य पूर्यन्मभूसर्पिषा ॥

Aśwavaidyaka, Ch. 34, v. 2. and 3.

See foot-note 2, P. 155.

#### NAIL-SHAPED PROBES.

Vāgbhaṭa¹ describes three other probes for the same purpose. They are eight anguli long; their ends are bent and resemble in size and shape the nails of the third, fourth, and fifth fingers respectively.

Paul<sup>2</sup> mentions a nail-shaped probe in the treatment of bubonecele. But this was applied as a cautery and not for the application of medicaments. Nail-shaped cauteries are also referred to by Hippocrates<sup>3</sup> in the treatment of recurrent dislocation of the shoulder-joint.

#### Jamvovaustha Probes.

Three probes are called Jāmvovoustha for their ends are shaped like the fruit of Jambul tree (Eugenia jambolanum).<sup>4</sup> Three other śalākā have their ends shaped like ankuša or elephant driver's goad.<sup>5</sup> They may be made of any length required

अष्टाङ्गुला निम्नसुखा सिस्तः च।रीषघ क्रमे । कनीनी-मध्यमाऽनामी-नखमान-समैर्मुखः ॥

Astanga Hrdaya Samhita, E xxv.

- <sup>2</sup> Paulus Ægineta, VI. lxv.
- 3 Hippocrates iii. 15.
- \* See foot-note 2, P. 155.

श्लाका ज्ञास्ववीष्टानं चारिऽग्री च प्रथक् वयं। युद्धात् स्थ्लानु द्रीर्घानां,

Aştanga Hrdaya Samhita, I. xxv.

For the diagram of the ankusa see Fergusson's Tree and Serpent Worship; Plate xxxiii. Sanchi, xxxvii, fig. I, and xxxviii, fig. 1 & 2,

<sup>5</sup> See foot-note 2, P. 155.

by the surgeon. These six varieties are recommended for the purpose of applying caustic medicaments and the actual cautery.

Paul<sup>1</sup> mentions a gamma-shaped cautery in the radical cure of hernia. This cautery is shaped like the Greek letter **r**; so it resembles the ankuśa cautery of the Hindus. The ankuśa is similar in appearance to the Greek letter.

One variety, which is used for the purpose of removing a tumour from the interior of the nasal cavity, has its end shaped like a khala or mortar, with sharp edges, and of the size of half the stone of the fruit of the jujube tree (Ziziphus jujuba)<sup>2</sup>. Vāgbhaṭa<sup>3</sup> mentions a similar probe for the purpose of applying actual cautery to a nasal tumour. Its end resembles in shape and size, a half of the stone of the fruit of the jujube tree.

This spoon-shaped probe of the Hindus is comparable to the curette like sharp cyathiscomele of the Greeks, noted before.

#### COLLYRIUM PROBES.

For the purpose of applying collyria to the eyes, a rod is mentioned having the length of eight anguli and the thickness of a pea. At both ends are shaped like buds<sup>4</sup>.

The probes for applying collyria to the eyelids, should be six anguli long, with a rounded bulbous end. They may be made of gold, or silver, or copper, or iron, or stone. For the habitual use of collyria, a lead probe is prescribed. When medicines are directed

<sup>&</sup>lt;sup>1</sup> Paul, VI. lxii.

<sup>&</sup>lt;sup>2</sup> See foot-note 2, P. 155.

<sup>&</sup>lt;sup>8</sup> कोलास्यि दल तुल्या स्या नासार्थीऽर्व्नुद दाहक्रत्॥

<sup>\*</sup> See foot-note 2. P. 155

to be applied not only to the lids but also to the conjunctiva, the finger is recommended as it is a softer and safer instrument. Again the probes would vary according to the nature of the collyria to be used. As for the application of lekhana collyrium, the probe should be made of copper and should be ten anguli long. The probe is advised to be made thinner at its middle to afford a firm grasp by the surgeon. The ends are shaped like buds. For applying ropana collyrium, a similar probe is to be used, but it should be made of steel; while for the application of a collyrium for the improvement of the visual strength, a probe made of gold or silver, and having the size and shape of a finger is recommended by Cakradatta. 1

Susruta<sup>2</sup> likes a probe of steel, or bell-metal, or copper for lekhana collyrium; and of gold, or silver, or horn, for ropana and snehana collyria. The probe should be eight anguli long, and the eye is to be kept open and fixed by the left hand, while the right hand is to hold the probe, and so the collyrium is to be applied to the eye.

<sup>े</sup> दशाङ्गुला तनुर्मध्ये शलाका सुकुलानना॥

प्रश्वा लेखने तासी रोपणे काललोहजा।

प्रङ्गुलीव सुवर्णोत्या इष्यजा च प्रसादने॥

Cakradatta. Āschyotana Cikitsā.

तेषां तुल्यगुणान्येव विद्ध्याह भाजनान्यपि । सौवर्षे राजतं शाङ्गेनामं वैद्र्य्येकांस्यजं॥ ज्ञायसानि च योज्यानि शलाकाश्च यथाक्रभं। वक्तयोन्मृंजुलाकारा कलाय परिमण्डला॥ ज्ञष्टाङ्गुला तनुर्मध्ये सुक्तता साधुनियङ्वा। ज्ञीड्गुल्यय्यस्मजातानि शारीरी वा हिता भवेत्॥

Sārngadhara<sup>1</sup> says: "The collyrium probe should be made of stone or metal. It should be eight anguli long and its ends must be made smooth and rounded like a common pea. For lekhana collyrium, a copper, or iron, or stone probe is to be used, while for ropana collyrium the tip of the finger is recommended for its softness."

Of the probes used by the Hindus for applying collyrium to the eyes, fortunately we possess a few specimens. Among the objects of interest found in the excavations at Bijnor, we find, "fourthly, one copper salai or instrument for applying antimony to the eye, similar to those found in the Bihat excavations."

मुखयोः कुण्डिता स्रच्यां श्र्लाकाष्ठाङ्गुलोन्मिताः। मध्यज्ञा भातुजा वा स्थात् कलायपरिमण्डला।। तामलोचाध्रमसंजाता श्लाका लेखने मता। सुवर्षरजतोद्भृता श्लाका स्नेष्टने मता। मङ्गुलीच मदुलेन कथिता रोपणी वृषः॥

> Šārngadhara Samgraha. III. xiii. Yogaratnākara. Eye Diseases. P. 823.

विफल सिललयोगे धङ्गराजद्रवे च हिविध च विषकत्को चौर बाजे मधूये। प्रतिदिनमध तप्त सप्तधा सीसमिकं प्रिचिह्तमध पथात् कारयेत् तच्छलाकाम्॥ सिवतुरुदयकाले साञ्जना व्यञ्जना का करकरिकसमितानकंप्रैषिद्यारोगान्। असितसित समुळान सन्धिवद्यांभिजातान् इरित नयनरोगान् सेव्यमाना श्रलाका।

Cakradatta, Netraroga Cikitsā.

<sup>&</sup>lt;sup>2</sup> "Vide Princep's (Thomas') Indian Antiquities, fig. 18. pl. iv" J.A.S.B. IX. 1.7.

Specillum with two olivary ends formed a variety of probe of the Greek and Roman surgeons. It was used as an ordinary probe in dealing with crooked fistulæ, and as a cautery to destroy the roots of hairs after epilation. Sometimes it carried an eye in one of its olives and was used in the treatment of nasal polypus. The eye was threaded with a cord having many knots along it. The other end of the probe was pushed through the nose and withdrawn by the mouth, and then by a sawing movement of the cord with both hands of the surgeon, the polypus was removed. A single probe for the application of semi-solid medicaments, occurs in the outfit of the oculist of Rheims, in the museum at St. Germain-en-Laye and is figured by Milne.

#### KARNA-SODHANA OR EAR-CLEANER.

This śalākā is said to have its end shaped like the end of a leaf of Aśvattha (Ficus religiosa). The instrument looked like a sruva—one of the famous spoons used in sacrificial ceremony.<sup>3</sup> It was used for the purpose of extracting wax from the ears.

The different kinds of spoons used in the ancient Hindu ceremonies were as follows: "Three different sruk or offering-spoons are used viz., the guhu, upabhrit and drubha. They are made each of a different kind of wood, of an arm's length (or according to others, a cubit long) with a bowl of the shape and size of the hand, and a hole cut through the bark and front

<sup>&</sup>lt;sup>1</sup> Paul VI. lxxxvii, VI. xiv, VI. xxv.

<sup>&</sup>lt;sup>2</sup> Græco-Roman Surgical Instruments, pl. xî. fig. 5.

<sup>&</sup>lt;sup>3</sup> वार्थशोधन सञ्चल्य पत्र प्रान्तं सुवाननं॥

side of the bowl and fitted with a spout, some eight or nine inches long and shaped like a goose's bill. The sruva or dipping-spoon, on the other hand, chiefly used for ladling the clarified butter (or milk) from the butter vessel into the offering-spoons, is of the "khadira wood (Accacia catechu), a cubit long, with a round bowl measuring a thumb's joint across and without a spout". 1

So we see that the bowl of the karna-sodhana was round in shape.

Susruta also mentions a salākā for the extraction of cerumen or minute insects from the ears, Cakrapāni alludes to it. In modern times, the ear-cleaner, as used commonly in India, is a tāla yantra. Ear specillum is frequently mentioned by the Greeks and Romans. It consisted of a small narrow scoop at one end and a simple probe at the other. The use of the scoop is thus described by Archigenes : "If a bean, stone, etc. fall into the ear, remove it with the small narrow scoop of the ear specillum". Celsus directs us to extract a scab or cerumen by means of the ear specillum.

The ear scoop used by the modern surgeons is a narrow scoop, more like the Hindu pujā vessel known as kuśi. The ear scoop is often made in combination with a director.

· Cakradatta, Karnaroga.

<sup>&</sup>lt;sup>1</sup> Satapatha Brâhmana, Sacred Books of the East. 1. 3. 1. 1. foot-note.

<sup>&</sup>lt;sup>2</sup> See foot note 1, P. 149

के क्लेट्यिला तु तैलिन स्त्रेटिन प्रतिलाय्य च।
शोधयित् कर्णगृथस्तु भिषक् सम्यक् श्रलाकया॥

<sup>4</sup> Galen. XII, 652.

<sup>&</sup>lt;sup>5</sup> Celsus, VI. viii.

# GARBHA-ŚANKU. FŒTUS OR TRACTION HOOK.

The end of this instrument is said to have been bent like ankuśa or elephant driver's goad. It is described to have the same length as the other śanku have i. e. ten to sixteen anguli, and it is eight anguli in width. It is recommended for extracting a dead fœtus from the mother's womb, after perforating its head by the mandalāgra or mudrikā knife. Suśruta recommends us to perforate the head and then to extract the bones by the śanku or hook, and lastly to apply traction by fixing it about the chest or axilla. If the head can not be perforated, it is to be applied to the eyes or cheeks.<sup>2</sup>

Traction hook for extraction of a dead feetus was well known to the ancients. Hippocrates<sup>3</sup> bids us break up the head of the feetus with a cephalotribe and remove the bones with bone forceps, or deliver it by a traction hook inserted near the clavicle. Celsus<sup>4</sup> advises us to insert a smooth hook with a short point and to fix it in the eye, or the ear, or the mouth, or the forehead, and so the feetus is to be dragged down. Soranus points out the best places for the insertion of the hook to be the eyes, the occiput, the mouth, the clavicles, and the

Aştānga Hrdaya Samhitā I. xxv.

Suśruta Samhitā. IV. xv.

नतीऽये शङ्कना तुल्यो गर्भ शङ्किरितिस्नृत:।
अष्टाङ्गला यतसीन सूदगर्भ इरित् स्त्रिया:॥ १६।

² त्तत स्त्रियमाश्वास मण्डलागेणाङ्गुलीयस्त्रेण वा शिरोविदार्था शिर:कपालान्याङ्कत्य शङ्कना ग्रङीत्वोरिस कचायां वापहरेदभिन्ने शिरिस चाचिक्टो गन्डे वा।

<sup>&</sup>lt;sup>3</sup> Hippocrates. II. 70.

<sup>4</sup> Celşus. VII. xxix.

ribs in head presentations; and the pubes, ribs, and clavicles in footling cases. Soranus, Aetius and Paul direct us to extract the fœtus in the same way but they recommend us to use two hooks instead of one, in order that the pulling may be straight down and not to one side.

Albucasis,<sup>4</sup> Rhases,<sup>5</sup> Haly Abbas,<sup>6</sup> and Avicenna<sup>7</sup> give similar directions for opening the child's head and for delivering the feetus with hooks.

This purpose in modern times is served by the blunt hook and crotchet.

#### YUJNA-ŚANKU OF MIDWIFERY FORCEPS.

An instrument is thus named and figured by modern writers on Hindu surgery, bearing some resemblance to the modern forceps, for extracting the child alive. We have, however, no mention of any such instrument in the works of Caraka, Susruta Vāgbhata and other ancient authorities. The Greeks and, Romans were also ignorant of it; and the Arabians fared no better, though Adams, in his commentary on Paul<sup>8</sup> asserts that Awicenna refers to forceps for the delivery of living childern. Mulder, in his valuable work, gives an extract from a translation from the works of Avicenna supporting

<sup>&</sup>lt;sup>1</sup> Soranus. II. xix.

<sup>&</sup>lt;sup>2</sup> Actius. IV. iv. 23.

<sup>3</sup> Paul. VI. lxxix.

<sup>\*</sup> Albucasis. Chirrug. II. 76 and 77.

<sup>5</sup> Rhases. Cont. xxii.

<sup>&</sup>quot; Haly Abbas. Pract. ix. 57.

Avicenna. iii. 21, i, 24.

<sup>&</sup>lt;sup>5</sup> Paulus. Æginita. III. lxxvi.

Historia Forcipum et Vecticum. p. 6.

conclusion. Smellie<sup>1</sup> "With the same savs: to the fillets and forceps, they have been alleged to be late. inventions; yet we find Avicenna recommending the use of both. The forceps recommended by Avicenna is plainly intended to save the fœtus". "He recommends all the old methods for assisting in natural labours; and if the woman can not be delivered by these, he orders a fillet to be fixed over the head: if that can not be done, to extract with the forceps; and should these fail, to open the skull; by which means the contents will be evacuated, the head diminished, and the fœtus easily delivered." Playfair also holds the same view. point is however by no means settled. For Milne4 says: "A full consideration of Avicenna's words seems to me to lead to the conclusion that he is describing no more than extraction with a craniotomy forceps. If the forceps fail, the child is to be extracted by incision, as in the case of a feetus already dead (and decomposed so that the forceps would not hold)."

Thus we may be sure that there is no available evidence of the use of delivery forceps by the Hindus, Greeks, Romans and Arabs; and the Chamberlens are still the undisputed claimants to the glory of the invention.

But there is no doubt that the Hindu surgeons tried extraction of the living feetus by manual traction. The hands are recommended to be well oiled and introduced into the uterus. If the child be dead, sharp intruments are advised to be intro-

<sup>&</sup>lt;sup>1</sup> Smellie. Treatise on Midwifery, p. 40.

<sup>&</sup>lt;sup>2</sup> Ibid, Edited by McClintock. New Syd, Soc, vol. I. Introduction p. 50.

<sup>3</sup> Researches on Operative Midwiffery, p. 10.

<sup>4</sup> Græca-Roman Surgical Instruments, p. 156.

duced into the vagina for cutting upon the fœtus. But on no account such instruments are to be used so long as the child is alive.

# SARPA-FAŅĀ OR SNAKE'S HOOD.

It is also called agra-bakra *i. e.* the end bent. It is a sanku or hook similar to the above, the end being bent like the hood of a snake.<sup>2</sup> It is to be used for the purpose of extracting stone after operation.

Susruta, in the operation for extraction of stone through the perineal incision, directs us to use the agra-bakra to bring the entire stone out of the wound. But in the case of females, he recommends us to use a knife having a spoon like a scoop, to prevent the formation of a vescico-vaginal fistula.<sup>3</sup> Is it a spoon-shaped knife, or is it a double instrument on a handle—a knife at one end and a scoop at the other? The Greeks used a knife having a scoop at the end.

1 गर्भे जीवित सूढ़ं तु गर्भ यह न निर्हरेत्।
हस्तेन सर्पिषाक्तेन योनेरन्तर्गतेन सा॥
स्ते तु गर्भे गर्भिन्या योनी शस्त्रं प्रवेशयेत्।
शस्त्रशास्त्रार्थविदूषी लघुहस्ता भयोजिक्काता।
सचेतनं तु शस्त्रेन न कथश्चन दारयेत्॥

Yogaratnākara, Muddhagarva Cikitsū.

Aştānga Hrdaya Samhitā. I. xxv.

<sup>&</sup>lt;sup>2</sup> त्रश्सर्याहरणं सर्पपणावदक त्र्यत:॥

<sup>े</sup> यथा च न भिदाने न चूर्ण्य ते वा तथा प्रयतेत चूर्णमन्यमध्यवस्थितं हि पुनः परिहिडिमिति तक्षात् समलामयवक्रेणाददीत । स्त्रीणान्तु विलिपार्श्वगतो गर्भाण्यः सिक्रक्रष्टः तक्साका सासुन्यक्षवच्छस्य पातयेदतीऽन्यथा खल्लासां मूचस्रावी वर्णो भवेत्।

Suśruta. Samhitā. IV. vii.

Celsus<sup>1</sup> describes the extraction of stone through a perineal section by means of the lithotomy scoop. "The scoop is slender at the end and flattened out in the shape of a semi-circle, smooth externally where it comes in contact with the tissue, rough internally where it meets the calculus". It was a long hook-like instrument.

Actius<sup>2</sup> mentions a special stone extractor, under the treatment of calculus in the female. Some understand by it the lithotomy forceps.

In modern times we use the lithotomy forceps and scoop for the same purpose.

I take this opportunity of referring to the celebrated passage in the famous Hippocratic oath, which runs as follows: "I will not cut persons labouring under the stone, but will have this to be done by men who are practitioners of this art". This sentence has given a good deal of trouble to the commentators and they have failed to understand the true reasons as to why Hippocrates specially forbade the practice of this operation. "M. Littré finds some difficulty in accounting for the circumstance that the noviciate in surgery is interdicted from the operation of lithotomy." Adams, commenting on the sentence, says: "Why this operation was proscribed, can not indeed be satisfactorily ascertained," and he quotes the Arab Physician, Avenzoar<sup>4</sup>, who "pronounces the operation to be one, which no respectable physician would witness, and far less to perform."

<sup>1</sup> Celsus, vii, xxvii,

<sup>\*</sup> Actius IV. iv. 94.

The Genuine Works of Hipprocrates, Vol. II. P. 777—8.

Avenzoar, 11, 2, 7.

The explanation that this was proscribed because there were men who devoted themselves exclusively to this kind of treatment, and that if the qualified surgeons be allowed to practise the operation, they would interfere in the sphere of action of the lay lithotomists, cannot be considered satisfactory. For the question still remains the open one, why should Hippocrates proscribe this operation from the domains of scientific surgery, simply because a few laymen happened to practise it.

The real explanation is that in Hippocrates' time success in the operation was very difficult to achieve, consequently he interdicted the operation much in the same way as abdominal operations were considered sacred before the days of antiseptic surgery. It is curious to find that Susruta calls this operation the worst of all surgical operations, for he says¹: "Even experienced and able surgeons fail to attain success by operation for the stone. So the surgical treatment is the worst of all treatment here. But if you do not operate, the patient will die; and it is doubtful whether he will live after the operation; so give him the chance of operation in God's name." I do not know whether this passage of Susruta has any causal relation to the remarks of Hippocrates, but there is no doubt that the former serves as a better commentary on the latter, than anything hitherto suggested.

Adams<sup>2</sup> says that this operation was practised by a class of men,

कुश्लास्थापि वैद्यस्य यतः सिडिरिच्छापु वा । उपक्रमी जघन्योऽयमतः स परिकौर्तितः ॥ अक्रियायां घुवो स्रत्युः क्रियायां संश्यो भवेत् । तस्यादाष्ट्रच्छा कर्त्तेवामीश्वरं साधुकारिणा ॥

Suśruta Samhitā. IV. vii.

<sup>&</sup>lt;sup>2</sup> Commentary on Paulus Ægineta. Vol. II, P. 363,

separate from the surgeons, in all countries in ancient times, and points out that the ancient operation of lithotomy is still practised with great success by the native doctors of Hindusthan. No conclusion is, however, to be drawn from the modern practices in India, as we find separate classes of men not only for stone, but also for bone-setting, cataract, etc. And whatever may be the practice in modern times, we find that during Suśruta's time, the operation was not the privilege of the laymen.

### SARAPUNKHA-MUKHA PROBE.

This instrument is also described to have its end bent like the hood of a snake. It is four anguli long and is recommended to be used for the purpose of extracting a tooth from its socket.<sup>1</sup>

Tooth elevator or instrument for levering teeth is mentioned by Galen.<sup>2</sup> It is of the same size as the bone lever which, according to Paul,<sup>3</sup> is seven or eight anguli long.

This instrument resembles in shape and action the tooth elevator of the modern surgeons.

ARDITACANDRA-MUKHA SALA. HALF-MOON PROBE.

The first half of this variety of salā is curved like a half-moon, to which is attached the second half as a rounded handle.<sup>4</sup> Susruta advises us to use it for the purpose of applying actual

Aştānga Hrdrya Samhitā. I. xxv.

# मध्योर्क इत्तदरङाश्च मूली चार्जुन्दुसन्निभां॥

Aştānga Hrdaya Samhitā I. xxv.

भरपुङ्गसुखं दन्तपातनं चतुरङ्गुलम्॥

<sup>2</sup> Galen, xviii, 593.

<sup>3</sup> Paulus Ægineta, VI. cvi.

श्लाकामन्ववर्मा नि।

cautery to the groin in bubonecele, to prevent the hernia from entering into the scrotum.

A crescent-shaped cautery was also used by the Greek and Roman surgeons. So Paul<sup>2</sup> says that in cases of sloughing of the prepuce we must cut it off and use lunated cauteries to stop hæmorrhage and prevent the spreading of the wound. Again he mentions a cautery shaped like the Greek letter  $\Gamma$ , in the radical cure of hernia.<sup>3</sup>

#### BONE LEVER.

Instruments for levering fractured bones into their proper positions are mentioned several times by Suśruta. In the treatment of fracture of the nasal bones, a śalākā is recommended to be used as a bone lever for raising and depressing the fractured ends. Sometime a musala or pestle is advised to be used. It is a thick wooden pestle the end of which is plaited with iron. It is still used to strike upon paddy to seperate the husk from the rice. Suśruta mentions its use to reduce dislocations of the joints of the shoulder and neck.

Ibid.

Tbid.

<sup>&</sup>lt;sup>1</sup> तव या वङ्गणस्था ता: दहेदडँग्टवक्कया।

सम्यग्मार्गावरोघार्थं कीश्प्राप्तां तु वर्ज्जयेत्॥

Suśruta Samhitā, IV. xix.

<sup>&</sup>lt;sup>2</sup> Paulus Ægineta. V1. lvii.

<sup>&</sup>lt;sup>3</sup> Ibid. VI. lxii.

<sup>\*</sup> नासां सद्रां विष्ठत्तां वा च्छज्ञीं कृत्वा श्लाक्या। Suśruta Samhitā, IV. iii.

चत्रसद्भवित् खित्रमचकम् मूषलीण तु।
 तथोत्रतं पीड्येच वंशीयाङ्गाढमेव च॥

तैलपूर्य कटाई वा द्रोखां वा शायग्रेझरं।। स्विनेत्विपेत् कवामांसससी विसंहते। स्थानास्थितच विश्वीत स्वितिक विचच्चथः॥

The pestle was also used by Hippocrates¹ to reduce dislocation of the shoulder joint. He says: "Those who accomplish the reduction forcibly bending it round a pestle, operate in a manner which is natural. But the pestle should be wrapped in a soft shawl (for thus it will be less slippery), and it should be forced between the ribs and the head of the humerus. And if the pestle be short, the patient should be seated upon something, so that his arm can with difficulty pass above the pestle. But for the most part the pestle should be longer, so that the patient when standing may be almost suspended upon the piece of wood. And then the arm and forearm should be stretched along the pestle, whilst some person secures the opposite side of the body by throwing his arms round the neck, near the clavicle"

The bone lever used by the Greeks is thus described by Paul:<sup>2</sup> "It is an instrument of steel about seven or eight fingers' breadth in length, of moderate thickness that it may not bend during the operation, with its extremity sharp, broad and somewhat curved."

#### DIRECTOR.

Suśruta³ mentions the use of eṣaṇī or metallic probes not only to ascertain the course of the fistulous track but also to raise the bridge of skin covering the sinuses, so that the surgeon may operate on it as a guide. Cakradatta⁴ also uses a probe to

<sup>&</sup>lt;sup>1</sup> The Genuine Works of Hippocrates. Adams' Trans. p. 372.

<sup>&</sup>lt;sup>2</sup> Paulus Ægineta, Vi. cvi.

<sup>&</sup>lt;sup>5</sup> पक्षेत्र चोपस्निग्धमनगाइसित्रं शय्यायां सितिविखार्थसमिव यन्त्रियता भगन्दरं समीचा पराचीनमनाचीनं वा विद्वर्षाखमन्तर्षाखं वा ततः प्रणिधायैषणीसुत्रस्य साध्यसुद्धरेच्छस्त्रेण Susruta Samhitā, IV. viii.

<sup>\*</sup> नाड़ीनां गनिमन्तिष्य शस्त्रेनापान्य कर्मावित्। Cakradatta, Nādivraņa Cikitsā.

learn the direction of the wound before operation. It is also mentioned in the Yogaratnākara.

In the treatment of fistulæ, Celsus<sup>2</sup> also says: "A director being inserted into them down to their termination, the skin ought to be incised." It is not mentioned that the esanī or probe was grooved, but there is no doubt of its use like a grooved director, so common nowadays. The discovery of such a director, along with several other surgical instruments, which are preserved in the Musee de Cinquantenaire, Brussels, proves that it was known to the Romans.

#### URETHRAL PROBE.

A variety of śalākā is described by Suśruta <sup>3</sup> to have its end rounded like the stalk of a mālatī flower (Echites caryophyllata, Rox.) It is to be used for cleaning the urethral canal.

Caraka<sup>4</sup> mentions a probe for examining the direction of the urethral canal and its pathological condition, before introducing the tube of the urethral or bladder clysters into it.

Caraka Samhitā, VIII. ix.

<sup>&</sup>lt;sup>1</sup> नाड़ीनां गतिमन्वीत्य शस्त्रे गोत्पाट्य कर्मावित ।

Yogaratnākara, p. 346. Græco-Roman Surgical Instruments, p. 73.

अ मृत्रमार्गिविश्रीधनार्थ एकं मालनीपुष्यवन्ताग्रप्रमाण परिमण्डलिमिति । Susruta Samhitā, I. vii.

ऋजो: सुखोपिवष्टस्य दृष्टे मेद्रे घतान्विते । श्लाक्यान्विष्य गति यदाप्रतिहता व्रजेत् ॥ ततः श्रेफःप्रमाग्येन पुष्यनेतं प्रवेश्येत् ॥

# Class VI. The Upayantra or Accessory Instruments.

The sixth class of the blunt instruments comprises the upayantra or accessory instruments. By surgical instruments, the Hindus consider not only the instruments proper, but also any mechanical aid by which the object of the surgical treatment is attained. Thus even medicinal agents are considered under this head for they help the inflammatory swellings to subside, or suppurate, or burst open as by various external applications. The accessory instruments are:

#### 1. RAJJU OR THREAD.

As an example of thread being used as an instrument of surgery, we know that the thread smeared with caustics are recommended by Suśruta<sup>1</sup>—kṣāra sūtra or caustic thread—for the operation of fistula-in-ano. For further informations on the subject see "Eṣanī or sharp probes" under the Śastra.

Thread as a material of phalavarti or tent is mentioned by Sarngadhara.<sup>2</sup> If after a vaginal or intra-uterine doughe, the injection does not flow out, he advises us to introduce a strong tent made of thread, dipped in oleaginous medicines of the

Suśruta Samhitā, IV, xvii. Cakradatta, Nādīvraņa Cikitsā.

Śārngadhara Samgraha, III. vii

क्षण्यदुर्व्वलमीरुणां नाड़ीमर्ग्वाचिताच या। चारस्तेन किन्दानत् शस्त्रेण विडमान॥

फलवित्ते निदध्यादा योनिमागे दृढं भिषक् ।
 स्वैदिनिर्माता सिग्धा भोधनद्रव्यसंयुताम् ॥

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sodhana (Purifier) group. Cakradatta¹ uses caustic threads in the treatment of piles by ligature.

## 2. VENIKA OR TWINE.

The use of twine as a ligature to be applied above the part bitten by a snake to arrest the circulation of blood towards the heart is mentioned by Suśruta.<sup>2</sup> Caraka<sup>3</sup> also advises us to tie ligatures above and below the bitten part, then to squeeze out the poison towards the wound, whence it is to be drawn out through incisions made by a knife.

# 3. PATTA OR BANDAGES.

For the proper application of bandages, Susruta mentions the following materials to be necessary: 4 viz., cloth manufactured

Suśruta Samhitā, V. v.

Caraka Samhitā, VI. xxv.

4 मत जर्ब त्रणवसन द्रव्याख्यपदेचाम: । तद्यथा चीमकार्पासविकदुकूल कीश्रेय पचीर्ण चीनपद्रचर्यान्व्यं क्लालालावूशकललता विदलरज्जुतूलफलसन्तानिका लीझानीति तेषां व्याधि कालं चिवच्योपयोग: प्रकरणतर्ये वामादेश:। तत्र कोश्यदामखिकानू विक्षितप्रतोली-मब्दलस्वितायमकखट्वाचीनविवस्ववितानगोफणा: पञ्चाक्षी चिति चतुर्दश्यवस्वविशेषा:।

तेषां नामभिरेवाक्ततयः प्रायेणव्याख्याताः। तचकोश्रमङ्गुष्ठाङ्गुलिपर्व्यमु विद्ध्यात्। दाम सम्बाधिऽङ्गे। सन्धिकृर्धकम् सनान्तरत्वकर्णेषु खिलकं। अनुविक्षितन्तु शाखासु,। श्रीवामिद्रयोः प्रतोलौं। इत्तेऽङ्गे मण्डलं। अङ्गुष्ठाङ्गुलिमेद्र्रायेषु स्थानकां। यमलङ्गय्योर्यमकं। इनुशङ्गगर्छेषु खद्यं। अपाङ्गयोशीनं। पृष्ठदरीरःसु विवन्धं। सृष्टेणि वितानां चिनुकनासीष्ठां सवस्तिषु गोप्तथां। जनुष्यक्षद्वे पश्चाङ्गीमिति। यो वा यिद्यान् शरीर प्रदेशे सुविविष्टो भवति तं तिक्षान् विद्ध्यात्।

Susruta Samhitā, I. xviii.

¹ भावितं रज्जनीचूर्यै: झुद्दीचीरे पुन:पुन:। वन्धनात् सुदृढं सूत्रं भिनत्तार्थी भगन्दरं॥ Cakradatta, Arsaroga Cikitsā.

<sup>2.</sup> सा तु रज्वादिभिर्वेडा विषप्रतिकरीमता।

उदंशात् तु विषं दष्टस्य विस्ततं विशिक्तां भिषक् बङ्घा। निष्पौङ्ग्रेदृस्थां दंशसुङ्गरिनास्त्रं वर्ळास्।।

from the fibres of plants, flax, cotton, wool, blankets, silk, leather, Chinese cloth, inner barks of trees, bark of bottle gourd (Cucurbita lagenaria), tendrils of twining plants, cane or pieces of split bamboo, rope, fruits as those of Bombax Malabaricum, blades of knives, and plates of metals as gold, or lead, or iron. These articles should be used with due consideration as regards the nature of the disease, the time of their use and the purpose in hand. He describes fourteen varieties of bandages as follows:—

- 1. Kośa:— a hollow cylinder or sheath to be applied to the joints of the thumb and fingers. This form of bandage is to be applied over the stumps after amputation of the limbs.
  - 2. Dāma (i.e. tail of a quadruped?):— it is a large bandage to be tied round a part for the relief of pain or cramps.

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- 3. Svastica or a circular cross-bandage:— it is to be applied round the joints, the space between the tendons of the great and second toes, the intermammary region, the glabella (space between the eyebrows), the plantar surfaces of the feet, the palmer surfaces of the hands, and the ears. It is also the form of bandage recommended in dislocations of the shoulder joint.
- 4. Anuvellita or an encircling bandage:—it is to be applied to the limbs. This form of bandage is recommended to be applied to the limbs in cases of oblique, deep, and large cuts inflicted by a knife. A leather bandage applied in the form of gophanā would also serve the purpose. The encircling bandage is also advised in cases of fracture of the ribs.
  - 5. Protoli:— a broad bandage for the neck and penis.
  - Mandala or a circular bandage:— it is to be applied to 23

the round parts of the body such as the arms, sides, abdomen, thighs, and back.

- 7. Sthagikā or a supporter:— a bandage enclosing a splint and pastes of medicaments to keep the parts firm. It is to be applied over the ends of the thumb, fingers, and penis. Susruta directs us to use this bandage round the scrotum after tapping the hydrocele.
- 8. Yamaka or a double-bandage:— a pair of circular bandages applied to a couple of ulcers on a part.
- 9. Khatvā or a four-tailed bandage:— it is recommended for the temples, cheeks and lower jaw.
- 10. China or a banner bandage:— a bandage for the inner angles of the eyes.
- 11. Vivandhana or a circular chest-bandage:— it is the bandage for the back, abdomen and chest.
- 12. Vitāna or a canopy bandage :— a large bandage for the head.
- 13. Gophanā<sup>1</sup> (*lit.* a sling for throwing stones):—a concave bandage for the chin, nose, lips, shoulders and pelvis.

Suśruta Samhitā, IV. ii.

पादी निरससुषस्य जलीन प्रोचा चार्त्तियी। प्रवेश्य तुत्रसेवन्या सुष्ती सीवेत्ततः परं॥ कार्यो गोफणिकावन्यः कट्यामावेश्य यन्त्रकं॥

शाखासु प्रतितां सिर्य्यक् प्रहारान्विहतान् भृश्यं । सीन्येत् सम्यग्निविद्याग्र सन्यस्थीन्यनुपूर्व्वशः ।। वदा विज्ञितकोनाग्र ततसीनेन सेचयेत् । चर्माना गोफाणावन्यः कार्यों यो वा हितो भवेत् ॥

14. Pañcāngī or a five-tailed bandage<sup>1</sup>:— it is intended for the parts above the clavicle, as in the dislocations of the lower jaw. Caraka<sup>2</sup> mentions a bandage called kavalikā, to be tied tightly after setting a fracture or reducing a dislocation. It is so-called from the medicinal paste which is applied to the affected parts, underneath the splints.

Dunglison mentions a bandage called Accipitar to be applied Over the nose. It is so called from its likeness to the claws of a hawk. It resembles the pañcāngī bandage of the Hindus.

So the bandages are recommended to vary according to the different parts of the body; and the surgeon, using his discretion, is to select the form of bandage suitable to the part. The bandages are recommended to be firmly secured to their place by three strings, applied upwards, downwards and obliquely. The knot is avoided over the seat of ulcer and tied on a side.

Susruta says: "Bandages are applied with three degrees of tightness according to the seat of the abscess:—

1. A tight bandage causes uneasiness but not actual pain;

2. A loose bandage is loose and relaxed; 3. An even bandage is properly applied—neither tight nor loose.

The tight bandage is to be applied to the buttocks, sides of the abdomen, axilla, groin, chest and head. The eyes and joints

Caraka Samhita, VI. xiii.

<sup>&</sup>lt;sup>1</sup> इन्तस्थिनी समानीय इनुसन्धी विसंहते। स्वेदियला स्थिते सम्यक् पञ्चाङ्गी वितरिद्विषक्॥ Suáruta Samhlitā, IV. iii.

श्रीख्यभग्नं चुतं सिन्धं संदधीत समं पूनः। समिन सममङ्गेन क्रलान्येन विचचयः॥ स्थिरैः क्रविकावन्यैः कुश्चिकाभित्र संस्थितम्। पष्टैः प्रभूत सर्पिक्वैवंश्लीयादवलं सुखं॥

are loosely bandaged. The even bandage is for the extremities, face, ears, neck, penis, scrotum, back, sides, and abdomen."1

Susruta next deals with the alterations in the mode applying bandages according to the rules laid down. 110 also advises the surgeon to be guided by the dictates of his He directs us to practise bandaging on the common sense. various large and small limbs of a human figure made of cloth or clay.2

With regard to the mode of application of bandages, Hippocrates says: 3 "It should be done quickly, without pain, with ease and with elegance, . . . . . it should fit well and neatly. The forms of it are the simple, the slightly winding (called ascia), the sloping (sima), the monoculus, the rhombus, and semi-rhombus"

The whole chapter of Susruta is very interesting and will repay perusal. If bodily transferred, it will adorn any modern text book on surgery.

As it is very difficult to covey a correct idea of these bandages in words, I have given figures of them from modern works on surgery, from which their construction and uses will be readily understood at a glance.

पौड्यव्रक्जो गाढ़: सोच्छास: शिथित: सृत:।

नैव गाढ़ो न शिथिल: समीवन्ध: प्रकीर्त्तित:।

तच स्मिक् कुचि कचावङ्कणोर: शिर: सुगाढ़:। शाखावदन कर्णकण्डमेदृमुष्कपृष्ठपाधी-दरस्मु समः। ऋच्योः सन्तिषु च शिथिल इति।

Suśruta Samhitā, I. xviii.

<sup>2</sup> पुसामय पुरुषाङ्ग प्रत्यङ्गविशेषेषु वन्धयीग्य'।

Ibid, I. ix.

तव व्रणायतनविश्रेषाङ्गस विशेषस्त्रिविधो भवति गादः समः शिथिल इति।

<sup>\*</sup> The Genuine Works of Hippocrates, Vol. II, P. 477. Syd. Soc. Ed.

#### ABDOMINAL BINDER.

Caraka<sup>1</sup> mentions the use of abdominal binder for the recently delivered woman to prevent derangement of air by its expansion in her abdomen.

Dr. Barnes says: "The sudden expulsion of one-tenth of the body-weight from the abdominal cavity is attended by a sudden removal of a force hitherto pressing upon the vessels and organs of the chest, abdomen, and pelvis. This entails in some cases a tendency to vacuum. Hence disturbance of the circulation. Now the binder, by supporting the abdominal walls, restores the equilibrium of pressure. The pressure exerted upon the uterus works as a gentle continuous stimulus to contraction. The woman is conscious of the support and is greateful for it.

.... The figure, so precious, and rightly so, to women, is better preserved . . . . So applied, the binder becomes one of the most efficient agents in antiseptic midwifery; it keeps the walls of the uterus and vagina in contact, thus preventing the collection of fluids or clots, and shutting out air".

The use of cloth for other surgical purposes is also mentioned:—

#### FIELD HOSPITAL.

The cloth is to be used for the manufacture of tents for the doctors to live in. The wounded in war are to be treated in such tents. The tent of the surgeon-general should be close to that of the king in the battle-field.<sup>3</sup>

<sup>े</sup> विष्ट्येट्टरं महता वाससा तथा तस्या न वायुव्टरे विक्रतिसुत्पाद्यव्यनवशाधावात्। Caraka Samhitä. IV. viii.

<sup>\*</sup> Obstetire Medicine and Surgery, Vol. II. p. 87.

क्षानारे च मङ्गति राजग्रेडादनन्तरं। भनेत् सर्विडितो नैसः सर्वेपकरशास्तिः॥

Small tents are also recommended for applying vapour bath to patients.

#### DRESSINGS.

Dīdhavala¹ mentions the use of medicated gauzes to be used as sponge by the females and says: "In discharges from the vagina, pieces of cloth soaked in decoction of barks of Vata (Ficus Bengalensis) and Lodha (Symplocos racemosa) and dried, should be put inside the canal."

In the Mohāvāgga<sup>2</sup> we find the use of itch-cloth:— "I allow, O Bhikkhus, to whomsoever has the itch, or boils, or a discharge, or scabs, the use of an itch-cloth".

"According to the 90th Pakittiya such cloth must not be more than four spans in length and two in breadth."

I can not help quoting from Mohāvāgga,<sup>3</sup> another discourse of Buddha as it shows clearly the surgical treatment of boils in ancient times:—

Now at that time a certain Bhikkhu had boils.

"I allow, O Bhikkhus, the use of the lancet".

Decoctions of astringent herbs were required.

"I allow, O Bhikkhus, decoctions of astringent herbs".

Sesamum salve was required.

ततस्यमिनं ध्वजवद्यशः ख्याति समुक्तितं। उपसपन्यमोद्देन विषशस्यामयद्दिंताः॥

Suśruta Samhitā, I. xxxiv.

ग्राधान क्षाम्य क्

Caraka Samhitā, VI. xxx.

<sup>&</sup>lt;sup>2</sup> Mahāvāgga. VIII. 17, 2.

<sup>3</sup> Ibid. VI. 14, 4 & 5.

"I allow, O Bhikkhus, the use of sesamum salve".

5. Compresses were required.

"I allow, O Bhikkhus, the use of compresses."

It was necessary to tie up the sore with cloth.

"I allow, O Bhikkhus, the use of bandages for tieing up wounds".

The sore itched.

"I allow you, O Bhikkhus, the sprinkling of a sore with mustard-powder".

The sore became moist.

"I allow you, Bhikkhus, to fumigate (the sore)."

Proud flesh formed on the wound.

"I allow you, O Bhikkhus, to cut off (proud flesh) with a lancet".

The wound would not close up.

"I allow, O Bhikkhus, the use of oil for wounds".

The oil ran over.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of fine rags, and of all kinds of ways of treating wounds".

If the object of fumigating the sore was to sterilize it, as it certainly was, we may take this dialogue as the best sketch of the scientific treatment of boils,— remembering that it represents the knowledge of surgery more than 2500 years ago.

Cakrapāņi advises us to tie the ends of the hairs of a patient, by a piece of cloth, before performing phlebotomy on the vessels of the head and neck.

<sup>&#</sup>x27; सदुपद्दात्तकेशानी जानुस्थापिंतकपर:।

#### 4. CARMA OR LEATHER.

The use of leather in ancient medical practice in India was manifold.

## Leather bandage.

Straps or belts of leather were used as bandages. Susruta¹ advises us to apply the leather bandage in cases where more than half the thickness of the upper or lower extremities are cut by some sharp instruments in a slanting direction. Then the parts of the wound should be well adjusted, the bone and the soft parts kept in apposition, and the wound closed by sutures and well covered by dressings, over which the leather bandage is to be applied in the form of a gophaṇā or sling.

Leather bandage in the form of gophanā is mentioned by Suśruta<sup>2</sup> to be applied over the anus to prevent recurrence of procidentia of the rectum. The prolapsed bowl should be well bathed with ghee and fomented; and then reduced by gentle pressure. There should be a hole in the bandage just in front of the anus to allow flatus to pass out. Vrnda<sup>3</sup> alludes to it. Similarly the modern surgeons use a pad supported by a bandage as an aid in

Suśruta Samhitā, IV. xx.

गी: फणयित। गी: फणा वन्धविशेष:।

उत्तं हि: उचारनिर्गमाय सिक्क्ट्रिय चर्मया चास्य गो:फ्यावन्य: कार्य्य इति ॥

Vṛndamādhava or Sidhhayoga, Ch. 57.

<sup>&</sup>lt;sup>1</sup> See foot-note 1, P. 178.

गुदसंभी गुदं स्तित्रं स्नेहास्यक्तं प्रवेशयीत्। कारयिदगोर्भणावसं मध्यच्छिद्रेण चर्म्भणा॥

<sup>&</sup>lt;sup>3</sup> गुदसं श्रे गुदं से हैं रस्य ज्याऽग्र प्रवेशयीत्।

<sup>&#</sup>x27;प्रविष्टं स्वेदयेचापि वर्डंगी:फणया भ्रथम्॥

preventing descent of the gut. 'It is mentioned also in the Cakradatta' and the Yogaratnākara.2

Drdhavala mentions the use of a piece of untanned leather to be applied over a layer of ointment during the day, while during the night the leaf of Eranda (Ricinus communis) is directed to be used.<sup>8</sup>

#### LEATHER LIGATURES.

In the treatment of snake-bite, a ligature is advised to be used above the seat of injury to stop the circulation of poisoned blood. This ligature is advised to be made of leather, or braided fibres of trees, or soft cord of jute, etc.

Yantra-śāţaka. Lithotomy Strap or Binding Apparatus.

This is the name of the leather shackle, which is recommended to be used during the operation for stone in the bladder. The patient should flex his knees and elbows; and the parts are to be

Yogaratnākara, P. 343.

Sagrate Sambite V. v

<sup>&#</sup>x27; गुद्धंभि गुदंस्निद्दैरभक्याऽऽग्र प्रवेशयीत्। प्रविष्टेस्वेद्येखापि वद्दं गी:फ्ल्या इद्म् ॥ Cakradatta, Kandraroga Cikitsā.

गृदर्भश्चे गृदं सितं चेडेनात प्रवेश्येत्।
 प्रविष्टं रोधयेदयबादस्थस्थितः चर्यनाः

<sup>ै</sup> एरखपतै: प्रकास राती करूरं विसीचयेत्॥ चौरान्त्रूचा तत: सिक्षं प्रत्येवीपनाहितम्। सुचेद्राती दिवावदं चर्चानिय सुजोनिन: ॥ १४। Caraka Samhitā, VI. xxviii.

सर्व्यरेवादित: सप्: शास्त्रादष्टस देडिन: ।
 दंबस्पोपरि वज्ञीयादिरदायतुराज्ञुति ॥
 प्रोतवर्व्यान-वस्त्रानां सद्नास्तरोन च ।
 म वक्ति विवं देडमरिष्टार्विनियादितं ॥

tied together by this instrument. Similarly, it is to be used during the operation for piles; but then, according to Susruta, the neck and thighs are to be tied by the instrument which is to be held firmly by the assistants. Vägbhata uses cloth instead of leather.

Yantra-sāṭaka is also to be used during the operation of phlebotomy. Suśruta says<sup>4</sup>: "If venesection is required to be done, the patient is to be seated on a stool, an aratni high (from the elbow to the end of the little finger), facing towards the sun. The thighs are to be flexed, the two elbows to be placed over the knees, and the hands (the fingers being elenched into fists) to be fixed on the two sides of the neck. The two ends of the shackle which pass over the fists, are held up at his back by the left hand of an assistant, who with his right hand steadily (neither forcibly nor loosely) presses above the part selected, to make the veins prominent, and at the same time rubs on the back to

Susrnta Samhitä, IV. vii

Ibid, IV. vi.

त्रथ यक्तेण वाससा।

# सक्यो शिरोधरायाञ्च परिचिप्त सनुस्थितम् ॥

Aştānga Hrdaya Samhitā, IV. viii.

\* तत व्यथ्यितं पुरुषं प्रवादिव्यमुखमरिजमानी कित उपने स्यासने सन्योराष्ट्रिकारी वितरीविवेश क्षेर्रसिवयसोपिर इलाइन्तर्युदाङ्ग प्रक्रतमुष्ठी मन्ययोः स्थापित्वा सन्वयादवं
गीवामुश्योरपिर परिविध्यान्येन पुरुषेण प्रयात्स्थितेन वातहकी नी सानिन बाटकान दंसं या इथिया ततो वैद्यो ब्रूयाइविणहत्तेन सिरोत्यान ना यात्रतिर्धितं सम्बन्धित्यसम् जानवावं
यन्तं प्रक्षमञ्जे च पोइयोतं कर्यमुक्त व वापुत्र्ये सुख्याने स्थापितं स

Sugrata Samhitā, III. viii.

सङ्जितजानुकर्पुरिमतिरेण सङ्घात्रवङ्कं स्त्वेण शाटकेंक्या ।

<sup>ै</sup> वस्त्रक्षक्वलकोपविष्टं यन्त्रशाटकेन परिवित यौवासक्षयंपरिकर्सिः सुपरिस्रकीत-सस्यन्दर्नेगरीरं क्रता।

stimulate bleeding, the patient being then told to inflate his mouth with air forcibly. This is the method of binding for puncturing the veins of the head except those (veins) which have their mouths turned inside the body". Vāgbhata describes a similar procedure in bleeding from the vessels of the neck.

The Greeks also used ligatures to tie up the arms and legs of a patient in the lithotomy position. Paul<sup>2</sup> says: "In operating, the woman should be placed on a seat in a supine posture, having her legs drawn up to the belly, and her thighs seperated from one another. Let the arms likewise be brought down to her legs and secured by proper ligatures about the neck".

In modern times, similarly, we use lithotomy straps or crutch, after placing the patient in the lithotomy position during the operation of lithotomy and excision of piles.

#### Pāśa.

This is a different shackle to be used for binding insane persons.<sup>3</sup>

Susruta Samhitā, VI. lxxii.

मश्रितापातपिस्तिभो जानृचासन संस्थित: ।
सदुपृशत्तकियानो जानुस्थापित कूपेर: ॥
सृष्टिभ्यां वस्त्र गर्भाभ्यां मन्ये गादं निपीड़ियेत् ॥
Aşţānga Hydaya Samhitā, I. xxvii.

<sup>&</sup>lt;sup>2</sup> Paul. VI. lxxiii.

भीमाकारैर्नरैनीगैर्दानैर्व्यालैय निर्व्विषे: ॥ भीषयेत् सततं पात्रे: कथाभिर्व्वाय ताड्येत्। यन्त्रयिला सुषुप्तं वा चासयेत्तं द्रणाग्निमा।

#### ABDOMINAL BINDER.

The use of cloth binder has been described before<sup>1</sup>. Leather binder is to be used after the operation of paracentesis abdominis to apply pressure over the abdomen. After draining the fluid of ascites, the abdomen of the patient should be well wrapped with blankets, or silk cloth, or leather binder, for then the abdomen would not be flatulently distended by air.<sup>2</sup>

#### LEATHER BAGS.

The use of leather in the formation of bags of the vastiyantra has been described before<sup>3</sup>.

STRO-VASTI. LEATHER BAG FOR THE HEAD.

For application of oil on the head, Suśruta<sup>4</sup> directs us to use a goat's bladder filled with medicated oil, just in the same way as ice bags are used nowadays.

Śārngadhara describes another variety of śīro-vasti: "It is

Suśruta Samhitā, IV. xiv.

Ibid, VI. xviii.

Sarngadhara Samgraha, III. zi.

<sup>&</sup>lt;sup>1</sup> See P. 181.

<sup>ै</sup> नि:खुतेच दोषे गाढ़तरमाविक काश्रेय चर्चाणामख्यतमेन परिवेष्टयेढुदरं तथा नाभापयति ৰাষ্ট্ৰ: ॥

<sup>^3</sup> See P. 129-30.

<sup>\*</sup> ऋज्वासीनस्य वभीयाद् वसिकोषं ततो हुदं।

श्रिरोविसिविधियान प्रोच्यते सुद्यसम्बतः। श्रिरोविसिवर्ध्ययः स्थादिसुखी द्याद्यम् सः॥ श्रिरःप्रमाणं तं वडा मस्तवे माविष्टकः। सन्तिरोधिक्विधायादौ सेचैः कोणोः प्रपृत्यत्॥ तावत् धार्यस्त यावत् स्याद्यासानित्रसुखस्तुतः। सेदनोपयसो वापि मावाणां वा सहस्रकम्॥

made of leather, has a length of twelve anguli and has two orifices or mouths. The leather bag is to be well tied round the head, the junction of the circumference of the bag and the skin should be well pasted with māṣa (Phaseolus Rox) glue. Then the cavity thus formed is to be filled with hot oily medicine. This is to be retained until the headache is relieved." Cakradatta also mentions it. The bag is described to be sixteen anguli high in the Yogaratnākara. Vāgbhaṭa advises us to use leather of a cow or buffalo, and it is said to have been twelve anguli broad.

#### LEATHER BAND.

In phlebotomy, a band is advised to be applied above the spot where the vein is to be punctured. This band is recommended to be made of cloth, or jute, or leather, or barks of

Cakradatta, Šīro-roga Cikitsā.

श्रीयरो वापितचर्य षोड्रशङ्गलसुक्तितम्। तेनावेष्य श्रिरोऽधसान्त्राषकक्केन लेपयेत्॥

Yogaratnākara, P. 402.

विधिक्षस्य निषषस्य पौठे जानुसमे सदौ । यज्ञाक्तस्विद्रदेषस्य दिनाने गव्यमाष्ट्रियम् ॥ द्वादशाङ्गुलविलीये चर्मपष्टं शिर: समम् । याकर्षे वन्यन स्थानं चलाटे वस्त्र विष्टिते । चैलविश्विकया वद्या मायकस्क्रीन चीपयेत् ॥ तती यथाव्याधि धर्तं खेइं कीणां निषेचयेत् । कदं कियम्बी यावद्याङ्गुलं धारयेव तम् ॥

Aştanga Hrdaya Samhitā, I. xxii.

भाषिरो व्यायतं चर्यः क्रांताष्टाङ्गुलसुच्छितम् ॥ तेनाविध्य शिरोऽधसान्याषकल्केन चिपयेत्। नियलस्थोपविष्टस्य तेलेक्षै: प्रपूर्येत्॥

trees, or tendrils of twining plants<sup>1</sup>; and it should not be applied either too tight or too loose. As for example, in phlebetomy in the foot, the yantra-sāṭaka or ligature should be applied below the knee-joint, while the band is to be tied round, at a distance of four anguli above the part selected for the operation.<sup>2</sup> Vāgbhaṭa<sup>3</sup> says: "In phlebotomy, a band is to be tied round the upper extremity, four anguli above the spot selected for opening the vein which is to be made prominent by pressing it upwards with the closed fist." Cakradatta<sup>4</sup> also quotes it. Vāgbhaṭa<sup>5</sup> recommends us to use a cloth band to be tied round the leg, four anguli above the spot selected for opening the vein in the leg.

This band corresponds to the band of Antyllus used by the Greeks. Antyllus applies a ligature of two fingers'

Aştānga Hrdaya Samhitā, I. xxvi.

वस्त्रपश्चमानिर्व्यक्तवलतानामस्यतमेन यन्वियता नातिगाढं नातिशिधिलं शरीर प्रदेशमासाद्य यथोकं शस्त्रं ग्रहीला सिरां विष्येत्॥

Suśruta Samhitā, III. viii.

ै तज्ञ पाद्व्यध्यसिरसा पादं समेख्याने सुख्यिरं खापियलानां पादमीषत्सङ्चितसुचैः इत्वा व्यध्यपादं नानुसन्धेरचः शाटकेनातेष्य् इसाम्याः प्रमीद्यः गुल्मं व्यध्यप्रदशसोपिर चतुरङ्गुलस् द्वोतदौनामन्यतमेन बन्धां पादासिरां विध्येत्।॥

Ibid.

क्षिमेनसमितां वाहावनाकुखित कूपेरे। वहा सुखीपविष्टस्य सुष्टिमङ्गुष्ठ गर्भिनीम्। कहें विध्यप्रदेशावः बहिकां चतुरङ्गुक्षां।।'

\* Cakradatta, Sîra-vyādhādhikāra.

पाद तु सुख्यितेऽवसाज्यानु सम्वेकियोङ्किः। गाउं कराज्यामागुल्कं चर्चा तस्य चोपरिश दितीये जुख्यिते किश्विदाक्टे इसवनतः। वहा विध्येत् सिरामित्समनुसेष्यिः कस्ययेतः॥

Aştānga Hrdaya Samhitā, I. xxvii.

<sup>े</sup> गावं वहीपरि हुदं रज्जा पट्टेन वा समस्।

breadth round the arm in bleeding at the elbow, while to bleed at the ankle, the band is to be applied at the knee. It is mentioned as fillet in the pseudo-Hippocratic treatise on Ulcers; and Oribasius gives an interesting dissertation on the subject, principally condensed from the works of Herodotus, Antyllus and Galen. Paul also ties a narrow band round some muscular part of the arm before abstracting blood from the inner part of the elbow. Wherefore we must tie a narrow band around some muscular part of the arm, and having by friction of the hands upon one another produced the necessary fulness of the vein, we divide it transversely, but only along its breadth."

### LEATHER BOTTLES, JARS, MASAKA, etc.

Leather was used in the manufacture of bottles and jars. Leather masaka for honey, Soma juice, and dadhi (curdled milk), is mentioned in the Royveda and also in the Laws of Manu where

चिक्द्रसः दधन्वतः सुमूर्वसः दधन्वतः॥

Rgyeda, 6 M. 48 S. 4 A. 8 Ch. 18 v.

यो 🗷 वां सधुनो हतिराष्ट्रितो रथचर्षयो ।

त्रत: पिवतमश्चिमा ॥

Ibid, 8 M. 5 S. 5 A. 8 Ch. 19 w.

चिक्क्ष्टं चम्बोभेर सीमं पवित्र या छन ।

नि वेडि गोर्धि लचि॥

Ibid, 1 M. 28 S. 1 A. 2 Ch. 9 v.

एव सोमो चचि लिच गवां त्रीक्यदिभि:।

इन्द्रं सदाय जीवृत् ॥

Thid, 9 M. 66 S. 7 A. 2 Ch. 29 v.

<sup>&</sup>lt;sup>1</sup> Ulcers, iii. 328.

Med. Collect., vii, Phlebotomy.

Panins Agineta, Adam's Trans. Bk. VI. Sec. XL.

<sup>\*</sup> इतेरिव तेऽइकमस्तु सर्खं।

swimming bladders, and we have a representation of "figures with garlands in their hands, swimming and disporting themselves, supported on masaks or inflated skins." In the Rgveda, Agastya in his spell to neutralize poison, says:" "I deposit the poison in the solar orb, like a leather bottle in the house of a vendor of spirits." Dr. Mitra points out that "other smrtis ordain that oleaginous articles preserved in leather bottles do not become impure by the contact of the impure cowhide; and in the present day, jars of that material are in extensive use in Bengal and the North-West Provinces for the storage of oil and ghee. In the latter place, leather bags are universally used for raising water from wells, and

ववित भीमो इपभक्षविष्या प्रश्ने शियानो इरिची विषयः । या योनि सोम: सुक्रतं नि वौदित गन्ययो त्वन्भवित निर्धितव्यक्षी ॥ Reveds, 9 M. 70 B, 7 A, 2 Cb, 7 v

एव स्य भानुद्धियति युज्यते रथः परिज्ञा दिनो आका शाणि । प्रवासी मसिनियथुना अधि नयी हतिसूरीयो मसुन्ते वि रप्यति ॥

Ibid, 4 M. 45 S. S A. 7 Ch. 1 ..

See Wilson's Rgveda, II. 28.

इन्द्रियाणां तु सर्वेषां यदोकं चरतौन्द्रियम् । ततोऽस्य चरति प्रचा हते: पादादिबोदकम् ॥

Manu Bachhita, 11, 90

"But when one among all his organs fails, by that single failure his knowledge of God passes away, as water flows through one hole in a leathern bottle."

Ibid, Jones' Translation

Rgveda, 1 M, 1918. 2 A. 5 Ch. 10 v.

<sup>&</sup>lt;sup>2</sup> Pl. xxxi, fig. 1. Fergusson's Tree and Serpent Worship, P. 127.

स्थे विषमा सजामि इति सुरावती ग्रेड ।

<sup>4</sup> Ibid, Wilson's Translation.

according to the law books of Sankha and Likhita,<sup>1</sup> that water is declared pure which is kept in old leather bottles". To this may be contrasted the prevailing Hindu notion that water is defiled if touched by a Brāhmana in his shoes. Though the leather is not allowed to be a material of dress of the Hindus, except his shoes which are considered as unclean, leather belts formed one of the eight sacred utensils necessary for a sramana of the Buddhist order; and in the Manu Samhitā³ we find the students of theology advised to "wear for their mantles, the hides of black antelopes, of common deer, or of goats."

#### 5. ANTARVALKALA, THE INNER BARKS OF TREES.

Barks of trees are recommended to be used as splints for the support of fractured bones. In fractures of bones of the foot, leg and thigh, Suśruta directs us to use splints made of barks of trees<sup>5</sup> to surround the limbs. In the treatment of a simple fracture, Bhāva Miśra advises us to use cold water first, then mud is to be applied, and lastly the fractured bones should be secured

Sankha and Likhita.

Manu Samhitā, 11. 41.

Suśruta Samhitā, IV. iii.

श्रापो ६पवदगन्धवत्यः परिग्रुइ जीर्णचर्याकरण्डकेवथ्युडृताः ।
 चर्याकरण्डः चर्यापुटः ।

<sup>&</sup>lt;sup>2</sup> Dr. R. C. Mitra's Indo-Aryans. vol. II.

कार्थारीरववास्तानि चर्मायि ब्रह्मचारियः। वसीरज्ञानुपूर्वेय शायाचीमाविकानि च॥

<sup>\*</sup> Ibid. Sir Wm. Jones' Translation. II. 41.

अभ्यज्य सिपंषापादं तलभगं कुशोत्तरं ।
 वस्त्रपट्टेन वधीयात्रच व्यायाममाचरित् ॥

by splints and bandages. In the Yogaratnākara, we are advised to treat fractures, by lowering the raised end and elevating the depressed end of the bone, and then by using splints and bandages to keep them in position. Bhāva Miśra, describes it similarly after Suśruta. Suśruta directs us to use barks of Vata (Ficus Indica. Rox.) and bamboo strips as splints to support the neck after reducing its dislocation by holding at the temporo-maxillary articulations on the sides and the occipital protuberance on the back, and raising him up in the air. He should lie down with his head raised for seven days. In modern times, the Sayre's suspension apparatus and jury mast serve the same purpose.

The barks of Madhuka (Bassia latifolia), Aśvattha (Ficus religiosus), Kukubha (Terminalia arjuna), Polāśa (Butea frondosa, Rox.), Udumbara (Ficus glomerata, Rox.) bamboo, śāla (Shorea robusta), Vata (Ficus Indica Rox.) are mentioned as

Yogaratnākara, P. 345.

• Suśruta Samhitā, IV. iii. Bhāva Prakāśa, II. iii. Bhagnādhikāra.

Susrutā Samhitā, IV. iii.

<sup>1</sup> मादी भग्न' विदिला तु सेचयेच्छीतलाग्तुना । पद्मनालेपनद्मार्थे वन्यनच सुभान्तितम् ॥ Bhāva Prakāša, II. iii. Bhagnādhikāra.

पक्केनालेपनं कुर्व्यादत्यनं च कुशान्तितम्। भवनामितसुद्रास्योदुद्रतं चावपीष्ठ्येत्॥ चिप्तं दिधापि च स्थाने संस्थाय्य विधिमाचरेत्॥

अवनामितसुत्रक्तो दुन्नतश्चावपौड्येत् ।
 आञ्कोदतिचिप्तमधोगतश्चोपरि वर्त्तयेत् ॥

भवटावयङ्ग्वीय प्रयस्त्रीत्रमधित्रः । तथा क्ष्यान् समंदत्ता वस्त्रपङ्गेन बेस्बीत् । स्त्रानं शायये सैनं सप्तराव्यमकान्द्रियः ॥

supplying the materials of splints<sup>1</sup>. Bhāva Miśra<sup>2</sup> adds Kadamba (Anthocephalus cadamba), Hijjala (Barringtonia acutangula), Sarjja (Pinus longifolia) to the list. Such splints are called kuśa, and Vāgbhaṭa<sup>3</sup> says that the splints should be broad, thin, pliant and clean.

Dr. Jacobi, of Dublin, says that he has seen an excellent splint made from the "fresh bark of a tree, taken off while the . sap is rising". "It fits admirably", says he, "just like paste-board soaked in water". Dr. C. C. Jewet recommends for the same purpose the bark of leriodend on, or tulip tree.

#### THE CRUTCHES.

The crutches were used to help the crippled. In the Vajasenīya Sainhitā of the White Yayurveda, there is a passage describing the different kinds of human victims, appropriated to particular gods and godesses. The passage occurs also in the Taittirīya Brāhmaṇa with slight differences. There we

Suśruta Samhitā, IV. iii.

- भधुकोदुग्वराश्वस्य कदम्य निचुललपः।
   वंशसर्व्यार्जनानास्य कुशार्थमुपसंदरेत्॥
  - Bhāva Prakāśa, II. iii. Bhagnādhikāra.
- कदम्बोट्स्वरायत्यसम्बर्धम् प्रतायनः। वंशोद्धवे वा प्रयुक्त सनुक्तः सुनिविधितेः॥ सुन्नाव्यः सुप्रतिसन्धे वेल्कलैः यक्तलैरपि। कुद्याद्वयः समं वन्धं पृष्टसोपरि योजयित्॥

Aştānga Hrdaya Samhitā, VI. xxvii.

भधूकीडुग्वृरायत्य पलाश कक्तभतचः। वंशसक्त वटानां वा कुशार्थमुपसंइरित्॥

<sup>\*</sup> Hamilton's Fractures and Dislocations. 5th Ed. P. 50-51.

<sup>.</sup> The 20th Mass. vois.

find "to the two (deities) who preside over the gains above or below one's expectation (utkula and vikula), a cripple, who can not move even with the help of a crutch" is recommended to be sacrificed. And again "to the divinity of land, a cripple who moves about on a crutch."

The use of the sound limb as a splint of support for the fractured bone of the opposite side was well known. Wooden splints resembling in shape the injured member are also recommended. Susruta says<sup>2</sup> that if the hand be fractured, it is to be tied with the opposite hand, but in fractures of both the hands, Gayadāssa<sup>3</sup> recommends a wooden hand to be used as a splint for both. After union of the fractured bones, the hands should be made to hold balls of cow-dung, mud and stones.

6. LATA OR CREEPERS ( TENDRILS OF ).

The tendrils of creepers as materials of ligature are mentioned

Taittirīya Brāhmaņa.

Quoted in Mitra's Indo-Aryans. vol. II. P. 84—85.

<sup>2</sup> उमे तले समे क्रला तलभग्नस्य देहिन:। वभ्रीयादामतेलेन परिषेकच कारयेत्। प्राग् गोमयमयं पिग्डं धारयेन् स्प्सयं तत:। इस्रो जातवलेचापि क्रार्यात् पाष्

Susruta Samhitā, IV. iii.

Quoted in Dallana's Commentary, IV. iii.

उत्मुलिवकुलाथां ( जत्मुलिवकुलिथः ) तिस्थिनं । भूग्ये पौठमिपनमालभते ।

<sup>ै</sup> नयोत् छमेऽपि इस्ततस्त तवेकस्य भङ्गे वामं दिस्तिग दिस्तिगं वासेन, छभयोस्तुभङ्गेन तस्त्रभेग, काष्ठनवेन कला हे भपि वधीयादिवं दार्थः भवतीति, स्त्पिष्डादिधार्यामात्मकर्म्य

by Suśruta. He recommends¹ to give up a patient, bit by a snake, as hopeless when he does not respond to the application of stimuli, such as cold water, tendrils of creepers, etc. Vāgbhaṭa² advises us to introduce the stalk of the lotus, with a thread tied to it, inside the throat to extract any foreign body stuck there. When the soft stalk is touched by the śalya, it should be extracted by the sudden withdrawal of the stalk and thread.

#### 7. VASTRA OR CLOTH.

Cloth<sup>3</sup> as a material of bandages, tents, gauze, etc. has been described before<sup>4</sup>.

### 8. ASTHĪLASMA. STONE OR PEBBLE.

It is a piece of stone—long and round. It is advised to be used for moving arrows fixed in the bone<sup>5</sup>. Caraka<sup>6</sup> advises us to strike two pieces of stone against each other to resuscitate a

Suśruta Samhitā, V. iii.

क्षारुखोतोगते शख्य सूच काछे प्रवेशयेत्। विसेनाचे तत: शख्ये विसं सूतं सनं हरेत्॥

Așțānga Hṛdaya Samhitā, I. xxviii.

- <sup>3</sup> वस्त्रं प्रसिद्ध तूलका सूत्रनिर्मितं वेष्टनार्थं प्रयुज्यते ॥
  - Vagbhatārtha Kaumudī, I. xxv.
- 4 See P. 176-83.
- अभ्रमप्रसरखण्डं भस्त्रपीड्नार्थं निर्घातनाञ्च युज्यते ॥

Ibid.

<sup>8</sup> श्रामनो: संघट्टनं कर्णयार्मुले श्रीतोदकेनोश्योदकेन वा सुखपरिषेक:। Caraka Samhitā, IV. viii.

अजीर्थ पित्तातप पोडितेषु वालप्रमिहेष्यथ गर्भिनीषु । वृद्धातुर चीयाषुभुचितेषु क्चेषु भीकष्यय टुर्ह्भिषु ॥ श्रस्त्रचते यस्य न रक्षमिस राज्योत्तताभिय न सम्पवन्ति । शोताभिराहिय न रोम हर्षों विषामिभूतं परिवर्ज्जयेतं ॥

still-born child. In bleeding from the veins of the neck, Vāgbhaṭa¹ advises the patient to hold firmly two pieces of stones in their hands.

A piece of stone is to be used by a person, for holding it with his hand, after recovery from fractures of the carpal and metatarsal bones<sup>2</sup>.

In ancient times, in India, the kings used to decorate themselves with antidotary gems, as a safeguard against poisons.<sup>3</sup> Even now the snake charmers apply a black stone on their bodies where they are wounded by the venomous reptile. This stone is popularly known as the vi-a-pāthara or poison-stone, and is supposed to have the property of extracting poison from the body.

#### 9. MUDGARA. HAMMER.

Susruta directs us to use a hammer or a piece of stone to strike an arrow firmly fixed in the bone, until loosened, when it can be conveniently extracted by means of a pair of forceps.

It should be pointed out that the tubular instrument—salya

- पाषाणगर्भहस्तस्य जानुस्य प्रस्ते भूजे। कुचेरारभ्य स्टिते विध्येङङ्गोईपट्टके।।
  - Aşţānga Hrdaya Samhitā, I. xxvii.
- \* See foot-note. 2. P. 196.
- विषक्षेद्धदने साती विषक्षमिण्यस्थित:। परीचितं समन्त्रीयागाङ्गुलाविङ्गिष्वृत:॥

Kāmandakīya Nītisāra, Ch. vii. v. 10.

रचितो गडुरीझार मिसिर्यस विमूषण । स्थावर नङ्गमं तस्य विषं निर्व्विषितां क्रजेत्॥

\* पिस्पदेशोत्तुष्डित महीलाज्ञमुद्गराणानगतमस्य प्रहारेण विचाल्य यथामार्गमैव: Suárutā Samhitā, I. xxvii, nirghātanī—described before<sup>1</sup>, served the same purpose. Vāgbhata also uses a hammer<sup>2</sup> to shake an arrow fixed in the bone, and directs us to extract it with the hands or by the various kinds of forceps<sup>3</sup>.

The Greeks used some iron instrument to shake such an arrow from the place where it was lodged. The hammer was also used by the Greeks and Romans but in a different capacity. Paul mentions its use in cranial surgery to strike the lenticular and gouge<sup>4</sup>. Paul and Celsus describe a "method of extracting foreign bodies from the ear by laying the patient on a board and striking the under side with a mallet." Vāgbhaţa describes this method for draining out water from the ear.

#### 10. PANIPADATALA. THE PALM OF HAND AND SOLE OF FOOT.

#### 11. Anguli or Fingers.

The surgeon's hand is considered by Susruta to be the principal instrument as the use of all other instruments depends

Ibid.

<sup>&</sup>lt;sup>1</sup> See P. 111.

<sup>·</sup> शृहराष्ट्रव्या नाजा निर्घायोत्तृष्टितं हरित्। तैरिव चानयेन्यार्गमार्गोद्यस्थितं तु यन्॥ Aşţānga Hṛdaya Samhitā, I. xxviii.

अधाहरेत् करप्राप्तः करणैवेतरत् पुनः। हस्यं सिंहाहिमकरवर्मि कर्कंद्रकाननेः॥ अहस्यं अपैसंस्थानादः ग्रहीतुं ग्रक्यते यतः। कक्षः अक्षाञ्च कुररं शरारी वायसाननैः॥

<sup>·</sup> Paulus Ægineta VII. zc.

Milne, Graceo-Roman Surgical Instruments, p. 125.

क्रब्राँड्रख् प्रूचों इसीन मधिला तैलवारिची। चिपेदघोसुखं क्रचे इत्यादा चूब्रोल वा। Aştānga Hydaya Samhitā, I. xxviii.

upon it<sup>1</sup>. But again he mentions the hand and foot as accessory to, or substitutes for, the instruments. Longmore<sup>2</sup> says: "Of all instruments for making a complete examination of a gun-shot wound as well as for exploring for foreign bodies which may be lodged in it, the finger of the surgeon is the most appropriate, whenever a wound is large enough to admit of its insertion." There are many instances of the use of hand and foot in the treatment of surgical diseases but I shall point out a few of them.

1. Both Suśruta<sup>8</sup> and Cakradatta<sup>4</sup> say that "if a swelling be hard but slightly painful, then it should be well formented, pressed and rubbed by a piece of bamboo, or palm of the hand, or thumb to cause its subsidence. Bhāva Miśra also quotes this verse <sup>5</sup>. Suśruta <sup>6</sup> and Vāgbhaṭa <sup>7</sup> recommend a similar treatment for enlarged glands.

Suśruta Samhitā, IV. i.

Cakradatta, Vraņašotha Cikitsā.

Bhāva Prakāśa, II. iii.

Suśruta Samhitā, IV. xviii.

Aştānga Hrdaya Samhitā, VI. xxx.

<sup>&</sup>lt;sup>1</sup> See foot note, P. 90.

<sup>&</sup>lt;sup>2</sup> Longmore, Gun-shot Injuries, 1877, P. 319.

अध्यज्य हिंदिशिला तु विख्ना वा श्लै: श्लै:। भिनह यिक्षिक्षक् प्राज्ञसलीनाङ्ग स्वेन वा॥

 <sup>\*</sup> अथज्य स्वेदियिला च वेग्रानाड्यातत: श्रनै:।
 विस्नापनार्थं सङ्गीयात् तलीनाङ्गुष्ठकेन वा ॥

अध्यच्य श्वेदिविलातु बिग्रनाखा शनै: शनै:। विमईयिक्विष्ठङ्मन्दन्तलेनाङ्गुष्ठकेन वा॥

हतेषु दोषेषु यथानुपूर्व यसी भिषक् स्रोप पंत्रिखितेतु ।
 सिन्नस्य विस्तापनमेव कुर्यादङ्गुष्ठलोहीपलविण् देखें: ॥

<sup>&</sup>lt;sup>7</sup> संस्वेदा वहुशोगस्यं विस्द्रीयात् पुन: पुन:।

2. Susruta says<sup>1</sup> that "when a morsel of food sticks in the throat, a blow should be fearlessly struck with the fist on the shoulder of the patient without his knowledge". Vāgbhaṭa² also describes it.

It is however curious to find that exactly the same procedure was adopted by Alsaharavius. Adams in his commentary<sup>3</sup> on Paul says that "when a morsel of food sticks to the œsophagus, Alsaharavius directs that the person should be struck on the back, which will facilitate the descent of it".

3. In the reduction of dislocation of the lower jaw, Caraka used his fingers to do it exactly in the same way as recommended by the modern surgeons. He directs us to depress the lower jaw by the thumbs and at the same time to raise the chin by the index fingers<sup>4</sup>. The verses are quoted by Cakradatta.<sup>5</sup> The description of the method, quoted from any modern text book, would be a good commentary on the above passage of Caraka. Erichsen says<sup>6</sup>: "The reduction is best effected, by the surgeon,

Suśruta Samhitā, I. xxvii.

Aşṭāṅga Hṛdaya Samhitā, I. xxviii.

- <sup>3</sup> Adam's Commentary on Paulus Ægineta, VI. xxxii.
  - व्यात्तानने इतुं खिनमङ्गुष्ठाभ्यां प्रपीषा च। प्रदेशिनीभ्याचीन्नस्य चिचुकीन्नमनं हितं॥ सक्तां सङ्गमयैत् खानं खन्यां खिन्नं विनामयेत्। प्रत्येकं खानदृष्यादिक्रिया वैशेष्यमाचरेत्॥

Caraka Samhitā, VI. xxviii.

¹ गासग्रक्येतु कण्डासक्ती नि:शङ्कमन बुङ्जलान्धी सुष्टिनाभिहन्यात् स्नेहं मदां पानीयम् वा पाययेत ।

अप्पान स्कृत्यचाताभ्यां गासश्वये प्रवेशयेत्।

<sup>&</sup>lt;sup>5</sup> Cakradatta, Vātabyādhi Cikitsā.

Surgery, Vol. II, p. 658.

standing before the patient, placing his thumbs, well protected by napkins, or a few turns of a narrow bandage, on the molar teeth on each side, and then depressing the angles of the jaw forcibly, at the same time that he raises the chin by means of his fingers spread out and placed underneath it."

4. Caraka says<sup>1</sup>: "After pairing her nails and covering the tip of her index finger with cotton, the nurse is to clean the palate, lips and throat of the new-born child".

With this passage we may compare what Barnes says on the point<sup>2</sup>. "The attendant having then placed the child close to the mother, so as to avoid any strain on the cord, should cleanse its mouth from any fluids, such as blood and mucus, it may have partially swallowed during its passage through the vagina. This should be done at once, as such fluids drawn into the lung vescicles may give rise to inflammation of the lungs, or even septicemia."

5. usruta<sup>3</sup> recognises "six modes of diagonosing diseases, namely by the five senses i.e. by hearing, smell, taste, sight and touch, and by questions. "Symptoms descernible by the sense of touch are coolness or heat, smoothess or roughness, softness or hardness, and other tangible qualities of the skin in fever, dropsy,

Caraka Samhitā, IV. viii.

<sup>े</sup> घणास्य तात्वीष्ठकस्य जिङ्गाप्रसार्ज्यं नमारभेतः घङ्गत्यासुपरित्विस्थितनस्यया सुम्रचातितो-\*मधानकार्पोस्तिषुनस्या प्रथमं प्रमार्ज्यितस्यास्य च बिरसासु कार्पासिपियुना केवनमेन प्रति-च्छादरीत्।

<sup>&</sup>lt;sup>2</sup> Obstetric Medicine and Surgery, Vol. II, p. 105.

<sup>ै</sup> षड्डियो कि रोगायां विज्ञानोपाय:। तदावा प्रश्नास श्रीमादिभि: प्रक्रेन चेति। \* \* \* \* स्पर्यनेन्द्रियविजेया: व्यैतोच्यक्तमा कर्ममध्यकुकादिनतः दयो कारभोकादिनु । Suárutā Samhlitā, I. x.

and other diseases." And we know how important it is to educate the tactile sense in the diagonosis of diseases.

6. The foot is recommended to fix a part of the human body whence any foreign body may be removed easily by the hands.¹ Suśruta says²: "If a foreign body cannot be easily extracted, as when it is impacted in the hollow or the substance of a hone, the part should be pressed by the feet, and it should by drawn out by the instrument." Vāgbhaṭa also gives a similar description³. Caraka describes a method of removal of the placenta if not spontaneously seperated. One of the female attendants should press upon the navel of the peurpera forcibly with her right hand, while with the left hand placed upon her back, she should shake her. Then the heel is to be placed on the patient's buttock while the two sides of the gluteal regions are also to be pressed and shaken⁴.

#### 12. JIHVA OR TONGUE.

The organ of taste as a means of diagonosis is noted by

- अस्थिविवरप्रविष्ट अस्थिविदष्ट वाऽवरुद्ध पादाभ्यां यन्त्रे गापइरेत्। Suéruta Samhitā, I. xxvii.
- श्रीखाद्वष्टे नरं पद्भ्यां पौड़ियला विनिर्हरेत्। इत्यथको सुविजिभि: सुरम्हौतस्य विकरि:॥

Aştānga Hrdaya Samhitā, I. xxviii.

\* तसाम्रे दमरा न प्रपन्ना सादयैनामन्यतमा स्त्री दिचयेन पाणिना नाभेरपरिष्टाइलवत् निपौदा सन्येन पाणिना प्रष्ठत उपसंग्रस्त सुनिक्त्तं निर्कृत्यात्। श्रयास्याः पादपार्थ्या-श्रोकीमाकोटयेदस्याः सिन्चाव्रपसंग्रस्त सुपौद्धितं पौक्येत्।

Caraka Samhita, Y.

¹ पाद इति पादेन शरीरदेशं धला इस्तादियन्त्रेण उद्दरणादि क्रियते। Vāgbhaṭārtha Kaumudī, I. xxv.

Suśruta¹. "Symptoms discernible by the sense of taste are the various tastes noticeable in morbid secretions of urine and other diseases". Cakrapāṇi "explains that 'inference' is necessary, because the sense of taste can not be exercised by the physician on the patient directly;" he must do it through some intermediate agents such as ants, whose attraction to sugar is well-known and so the presence of sugar in urinary diseases can be inferred."

#### 13. Danta or tooth.

Ivory as a material of surgical instruments has been described before. Susruta advises us to use the ash of ivory with stibium as a stimulant to the growth of hair on a sear. It is also recommended by Vagbhata's.

#### 14. NAKHA OR NAUS.

Susruta advises the surgeon to use his mails, for the operation of cutting, piercing and extraction, if these can be possibly helped by his nails.

In modern times, nails often help the surgeons in separating

Sukruta Sashkita, IV. I.

Sukrata Sachhita, I. viii.

<sup>🚅 !</sup> रसनेन्द्रिविज्ञेयाः प्रमेश्वादिव् रमविज्ञेषाः ।

Astadim Hrdaya Sudhitá, 1, v.

<sup>\*</sup> Hornle's Commentary on the Soirata Sumbita, I. s. (Bibliotheca Indica).

<sup>\*</sup> See mage 67.

इसीदनाससीं स्न श सुख्यक्षेत्र रसाक्षतं ।
 रोगाखेतन जायमं नेपान् पानितन्त्रियाः।

तैसाला पश्चिदनस्य सभी वा चीवर्थ प्रदस् ।। Anjáthen Hydaya Santhitá, VI. sziv.

<sup>&</sup>lt;sup>6</sup> चाहार्यंच्येयभेधेषु नवां त्रक्षेषु बीजधेत् ।

layers of tissues during operation as in the operation for the radical cure of hydrocele. We often extract thorns, impacted in our body, with our nails.

#### 15. MUKHA OR MOUTH.

The use of mouth as a suction apparatus was well known to the ancients. Susruta advises us to use ārā or pāṇimantha (awl) to perforate bone in diseases of the medullary canal, caused by obstructed and deranged air. He next introduces one end of a tube, open at both ends, into the canal through the perforation in the bone, while through the other end the surgeon sucks out air by his mouth. The use of mouth for sucking out air through the śriiga or horn has been described before. Caraka says that the poison of a snake-bite may be sucked out by the surgeon's mouth, filled with flour or ash. Even in modern times, it is common amongst Indians to suck out blood, in accidental cuts by knives, by the mouth. The practice of the suckers in Europe has been noted before.

#### 16. Vāla or hair.

Horse-hair is to be used for applying ligatures round the piles<sup>5</sup>. It is also a material of suture for the skin. Horse-hair is also described to have been used for raising pterygium. Paul<sup>6</sup> also used horse-hair to raise a pterygium.

निरुद्धेऽस्थिन वा वायौ पाणिमन्थेन:दारिते। नाड़ौं दम्तास्थिनि भिषक् चूष्रथेत् पवनं वली॥

<sup>&</sup>lt;sup>2</sup> See P. 148-49.

Suśruta Samhitā, IV. iv.

<sup>&</sup>lt;sup>3</sup> दंशं वा चूषिम्मूखेन यवचूर्णपांश्रपूर्णेन।

Caraka Samhitā, VI. xxv.

See P. 149-50.

<sup>े</sup> वाला:, प्रश्वादीना पूक्कभवतिया वृतियास प्रश्नी वाल्यादि वन्यनार्थ युज्यते।

º Paulus Ægineta, VI. xviii.

Vāgbhaṭārtha Kaumudī, I. xxv.

Susruta<sup>1</sup> says: "Bundles of hairs or tents are to be use in the treatment of wounds in the skull, formed by the extraction of an arrow from the brain. These would prevent the hernial protrusion of the cerebral subtances from passing on through the wound. The hairs are to be removed one by one as the wound heals up gradually." Vagbhata<sup>2</sup> also approves this treatment.

A bundle of hairs tied to a long thread is mentioned by Susruta to have been used for the extraction of fish-hones from the throat<sup>3</sup>. The patient is directed to swallow the ball of hairs with some liquid. Next emeties are to be administered to excite vomiting. During this act, the foreign body gets entangled in the meshes of the ball, which being then suddenly pulled out by the thread outside, extracts the fish-hone satisfactorily. Vāgbhata<sup>4</sup> also describes it similarly. For this purpose

Sufruta Sarbhita, IV. 11

- कार्य्या बल्बाइते विदे भक्ताबिदिलिते क्रिया । शिरसीपहते बस्वी वालवित्ते प्रवेशवेत् ॥
- भत्ततुप्रस्ति तृद्धी क्ष्मादिनं चनीप्रस्थाः
   त्रदे रोक्ति चैसैसं मनैरपन्धत् सचनः
   भस्तुक्षस्तीः सादेशस्ति सानवानीवजान् ।।

Actanga Hydaya Sambita, VI. agei

Bulcuta Sashbitá, I. axvii

श्रीत्रवीऽपञ्चति शर्त्वा वालविन प्रवेशवेत् । वालवन्त्रामदन्त्रया मन्तुलक्षा वचान् वावत् ॥

<sup>े</sup> परिवास्त्रमण्या तिर्धेन् करासमानिका वैज्ञोकुकं हुई क श्ववह हक्त्रमानिकः व्यव्यवेदानकात्र पूर्वनोतं नानवेदनतम् वक्त्र सदैवकः भागा कृतं सहसा आविषेत् ।

कोशोन्द्रकेन पीतेन हवै: कन्टकानाकिपेत्।
 सहसा स्ववसेन वसत कीन वैद्यारत्॥
 Astanga Hedaya Sashhitá, 1. xxvisi.

a tooth brush formed by chewing the end of a narrow branch of a tree is also recommended. A common domestic remedy is to make the patients swallow large morsels of boiled rice, plantain, etc.

Paul<sup>2</sup> mentions a similar contrivance, and says: "Some are of opinion that the patient ought to be made to swallow large morsels, such as stalk of lettuces or pieces of bread; but others direct us to bind a thread about a small piece of clean soft sponge and give it to the patient to swallow, and then taking hold of the thread to draw it up, and to do this frequently in order that the thorn may get fixed in the sponge and be brought up". For this purpose Aetius used the epilation forceps. Paul calls it acanthobolus or the fish-bone forceps.

The modern surgeons use a probang for the same object. "Small sharp bodies, such as bristles, fish-bones, or pins, are generally found sticking between the pillars of the fauces and the tonsils." Such bodies "should not be pushed on, but an endeavour should be made to catch them with the "horse-hair probang." This being pushed gently, unexpanded, beyond the point where the pin or bone is stuck, is expanded by pulling up the handle and then withdrawn with a slight rotatory motion."

Caraka4 mentions the practice amongst the recently delivered

<sup>&</sup>lt;sup>1</sup> सदुना वा दन्तभावनकुभँकेनापहरेत्।

Suśruta Samhitā, I. xxvii.

Paúlus Ægineta, VI. xxxi.

<sup>&</sup>lt;sup>3</sup> Swain's Surgical Emergencies, 3rd ed., Pp. 32-33.

<sup>🌯</sup> चनास्यु। वालविच्या कच्छतालु परिमग्रेत्।

Caraka Samhitā, IV. xviii.

women to push a braid of her hair into her throat, to help the expulsion of the placenta. So in the Yogaratnākara<sup>1</sup>, her throat is advised to be rubbed by a finger surrounded by hairs. This practice is still prevalent among the women of Bengal to a certain extent.

#### SUTURE MATERIAL.

Horse-hair was the material used by the Hindus for sutures. Besides it, they used 2 sutures of fine thread, or the fibres of the bark of Asmantaka (Cæsalpina digynia), or threads made of hemp or flax, or of the fibres of which bow-strings were made, or of the fibres of the Mūrvvā (Sansevieria zeylanica) or Gudūcī (Tinspora cordifolia). Besides these, the Hindu surgeons used the mouth parts of the ants as clasps to close incisions on the intestines. Susruta 3 describes the use of living black ants to close the incisions on the walls of the intestines, during the operation for intestinal obstruction, after removing the seyballi, stones, etc. He advises us to remove the bodies of the ants, leaving their heads fixed on the margins of the incision,

Yogaratnākara, P. 437.

Suśruta Samhitā, I. xxv.

साया स्वेष वल्सले:। सीय्येत दूरी नासन्ने स्टहानास्यंन वा वहु॥

Aşţānga Hrdaya Samhitā, I. xxix.

Suśruta Samhitā, IV. xiv.

<sup>&</sup>lt;sup>1</sup> केशविष्टित्याङ्गुला तस्याः कग्छ प्रघर्षयेत्।

शैन्येत् स्काण स्तेण वल्केनास्मन्तकस्य वा। सनज्यौमस्ताभ्यां साया वालेन वा पुन:॥ मूर्व्यागुडुचीतानैर्वा।

³ परिस्नाविख्यप्येवनैव शस्त्रमुबृत्यानासावान् संशोध्य तच्छिद्रमन्त्रं समाधाय क्रण-पिपौत्तिकाभिदेशयेत् दष्टे च तासां कायानपङ्गित्र सिगासि ततः पूर्व्यवत् सीव्येत् ।

in the act of biting. Then the intestines should be replaced with the ants' heads sticking to them. Caraka¹ also describes the use of ants for obliteration of small perforations in the intestines, but he takes away the ants before replacing the gut into the abdominal cavity. If by any accident, the abdominal muscles be incised and the intestines come out of a gaping wound, Susruta recommends us to allow black ants to bite the exposed coils of intestines before replacing them into the abdomen². This is a curious practice of ancient surgery of the Hindus. The Greeks and Arabs never mentioned it. "Amongst some Indian tribes, it is customary to allow both edges of a wound to be seized by the sharp head-nippers of certain ants, whose bodies are then rapidly cut off; one ant after another being used, the wound is closed."

Suśruta describes four sorts of sutures, viz:

- 1. Vellitaka or winding.
- 2. Gophanikā or like a sling.
- 3. Tunna sevanī or continued sutures.
- 4. Rjugranthi or interrupted sutures.
  - किंद्राख्यलस्य तु स्यू लैदेशियला पिपीलिकै:। वहुश: संग्रहीतानि मला च्हिला पिपीलिकान्। प्रतियोगै: प्रविस्थाल विह: सीव्येट वर्ष तत:॥

Caraka Samhitā, VI. xviii.

श्रिमित्रमन्त्रं निष्कुान्तं प्रवेश्यं नाम्यया भवेत्। पिपोलिकाशिरोग्रलं तदाय्ये के वदन्ति तु॥ प्रचाल्य पयसा दिग्धं त्याशोणित पांग्रिभिः। प्रवेशयेत् क्रचनखो छतेनाक्तं श्रनैः श्रनैः॥

Suśruta Samhita, IV. ii.

Neuburger's History of Medicine. Playfair's Translation, Vol. I., P. 9

These are advised to be so applied as they may suit the different parts of the body<sup>1</sup>. The needles must not be introduced either too far from, or too close to the edges of the wound. In the former case, the lips of the wound shall be inflamed and so cause pain, while in the latter, the sutures will give way".

The use of horse-hair as a material for suturing wounds was unknown to the Greeks and Romans. They used sutures of flax and woollen threads for wounds. Paul says: "Afterwards we unite the seperated parts with a needle containing a woollen thread, being satisfied with two sutures." Celsus advises us to use sutures of soft thread; and the apolinose of Hippocrates is directed to be made of crude flax.

# Aśvakaţaka. The RING OF A HORSE'S BRIDLE.

Susruta says that when the arrow is firmly fixed in the bone and if it can not be extracted by forcible pulling by hands or instruments, it should be tied to the ring of a horse's bridle. Then the animal is to be whipped, when by the sudden movement of the horse, the weapon would be jerked out of the wound.

# 18. Śākhā or branch of a tree.

Another method is to tie such an arrow by means of a rope

सौव्येदेक्षितकं शनै:। सौव्येद्गोफणिकां वापि सौव्येद्ग तुन्नुमेवनीं। सजुरात्यिमयो वापि यथायोगमयापि वा॥

Suśruta Samhita, I. xxv.

1

<sup>&</sup>lt;sup>2</sup> Paulus Ægineta, VI. xii. Adam's Translations.

<sup>&</sup>lt;sup>8</sup> Celsus, V. xxvi.

<sup>4</sup> Hippocrates, iii. 132.

<sup>&</sup>lt;sup>5</sup> अञ्चनक्रकते वा विधीयाद्येनं कश्या ताड्येदाशीम्नस्यन् शिरीवेगेन श्ल्यसुद्धरति। Susruta Samhitā, I. xxvii.

to the branch of a tree, lowered by pressure<sup>1</sup>. When the pressure is released, the branch suddenly goes high up, and thereby it pulls the weapon out of the wound<sup>2</sup>. Dallana, however, mentions another view that a bridle-ring and a branch of a tree are both required for the extraction of foreign bodies<sup>3</sup>. Hærnle remarks: "The branch apparently is put through the ring to afford a stronger pull"<sup>4</sup>. Vāgbhaṭa<sup>5</sup> also mentions these contrivances.

# 19. ȘȚHĪVANA OR SPITTLE.

Dallana<sup>6</sup> understands by it—" throwing out expectoration and saliva by the mouth." By this means any foreign body lodged in the oral cavity, such as in the gums, fauces, may easily be got rid of.

Nivandha Samgraha, I, vii,

Eदां वा त्याखामवनस्य तासां पूर्ववदवडीखरेत्। Susruta Samhitā, I. xxvii.

² शाखा, वचशाखा, वहायास विनिमितायां शाखायां श्रत्यायभागं स्टं वज्जा, सहसा शाखात्यागेन उच्चितया शाखया श्रत्यमुद्रियते। Vägbhatārtha Kanmudī, I. xxv.

³ अन्ये तेवं पठिन्त अग्रकामिवं वा वलवितः सुपरिग्टिहतस्य यन्त्रे पौनं ग्राह्यिता श्रत्थ-मावश्चं प्रविभून्य धनुर्गु नैर्व्वेडेकतः श्रायाश्ववज्ञकटके विश्वीयात्। अधैनम् इत्यच कारकेक पाठः क्रम्या ताड्येत् यथोन्नमयन् शिरोवेगेन श्रत्यमुद्धेरित, निमतायां पञ्चाङ्गां इत्त्रशाखायां. व पूर्व्वद वद्घोद्धरिदिति ॥ Nivandha Samgraha, I. xxvii.

<sup>4</sup> The Suśruta Sanhitā. Bibliotheca Indica. P. 48. foot note 109.

<sup>े</sup> तथाप्यश्रको वारङ्गं वक्षीक्षत्य धनुक्येया।
सुवद्धं वक्षकटके वधीयात् सुसमाहितः॥
सुसंयतस्य:पञ्चाङ्कप्रा बाजिनः कश्यायथ तम्।
ताङ्ग्रेदिति सूर्ज्ञानं विगेनोन्नसम्यन् यथा॥
सुद्धिक्क्ष्यमिवं वा शाखायां कल्प्येक्तरीः।
Astanga Hrdaya Samhitā, I. xxviii.

<sup>•</sup> श्रीवर्णं से भादिनिरसनम् ।

#### 20. Provahana or fluxing the patient.

This comprises the acts of emesis, purgation and lacrymal secretion. Thus the foreign bodies lodged in the alimentary canal or eyes may be got rid of by causing discharges from the bowels, the stomach, or the eyes<sup>1</sup>.

### 21. Harşa or objects exciting happiness.

Persons suffering from vrana or wound are directed to have their minds in a state of cheerfulness by the sight of objects exciting happiness<sup>2</sup>. A cheerful man is a better subject for a surgical operation than a morose and gloomy one. Vāgbhaṭa<sup>3</sup> adds fear as an accessory instrument. Joy and fear cause a sudden change in the temper of a man and so may be of some help in curing diseases<sup>4</sup>. Susruta regards, sorrow as a salya or foreign body which is to be removed by joy.<sup>5</sup>

22. AYAŞKĀNTA OR LOAD-STONE.

Magnet was known to the ancient Hindus<sup>6</sup> and they used it

- मुह्नदो विचिपन्याग्र कथाभिक्ष्यवेदनाः। भाषास्यन्तो वहुशस्तनुक्ताः प्रियस्वदाः॥
  - भाषासयन्ता वहुशस्तराञ्जूलाः प्रयम्बदाः॥ \* \* \* \*

सम्पदायनुकूलाभि: कथाभि: प्रौतिनानस:।
प्राथानान् व्याधिमोत्ताय चिप्र' सुखमवाप्र्यात्॥
Suaruta Samhitā, I. xix.

- <sup>3</sup> See foot-note 1, P. 98.
- भय हर्षो शरीरस्य सहसा भावान्तरसुत्पादयन्ती यन्त्रकार्य्य कुरुत इति । Vāgbhaṭārtha Kaumudī, I. xxv.
  - इटावस्थित मनेक कारणीत्पद्गं शोकश्रस्यं इपेंगिति।
    - Suśruta Samhitā, I. xxvii.
  - <sup>6</sup> मृथिगमनं स्थाभसपेयामहष्टकारयातं । Vaiseşikā Darsanam, Ch. V. Āhnika 15.

¹ तवाशुचवयूहार कास मूत्र पूरीषानिले: खभाववलप्रहते नयनादिश्य: पतित । Susrata Sāmhitā, I. xxvii.

to extract minute foreign bodies such as iron particles from the eyes and teeth. Susruta<sup>1</sup> also mentions its use for extracting an arrow from the wound, if it be without barbs.

In modern times, a magnet is still used for removing a particle of iron from the eye. "Indeed, cases have occurred in which the application of an inch bar-magnet connected with four Grove's cells to the outside of the cornea has caused the foreign body to retrace its course and emerge through the wound". A fragment of iron lying in the vitreous has been removed by the Snell's electro-magnet introduced through the scleral wound behind the ciliary region. "The following plan of ascertaining whether a portion of needle be really impacted has been suggested by Marshall, and successfully carried into practice by Littlewood of Leeds. A powerful magnet is to be held upon the part for a quarter of an hour, so as to magnetise the fragment; a firmly hung polarised needle should then be suspended over it, when, if any iron is present, deflection will ensue."

# 23. KSARA. CAUSTICS OR POTENTIAL CAUTERY.

Caustics were highly extolled by the ancient surgeons as the external applications are better tolerated by the weak and

स्थाभिसर्पथिमिति स्चीपदेन लीइमात टणबोपलच्चयितः तथा चायस्तानाभिसुखं यत् स्थादेर्गमनं \* \* \* \* \* \*

Śańkara Miśra, Upaskāra.

Suśruta Samhitā, I. xxvii.

अनुलोसमन्यवद्यसर्थमन्य त्रवासुखस्यकान्तिन ।

<sup>\*</sup> Carter's Ophthalmic Surgery, 2nd ed., P. 369.

Erichsen's Surgery, Vol. I, P. 343.

timid persons who are afraid of the surgeon's knife¹; though Suśruta² distinctly states: "The following persons should not be treated with caustics: weak people, children, old and timid people, etc." They even give them preference to the knife for they argue that surgical diseases are radically cured by the application of the caustics, without any possibility of recurrence. Suśruta says³: "Of all cutting instruments and their substitutes, caustics (or vegetable alkalis) are the most important, because by means of them deep and superficial incisions and scarifications may be made, derangements of the three humours may be rectified and some diseases can be treated with special advantage."4

For the preparation and uses of caustics, see the Suśruta Sainhitā, I. xi.

For the application of potential cauteries, three classes of instruments are recommended.

1. Darvvī—it is to be made of wood and should resemble a spoon in appearance.

Aşṭāṅga Hṛdaya Saṁhitā, I. xxix.

Suśruta Samhitā, IV. vi.

<sup>&</sup>lt;sup>1</sup> भ्रत्यसलेऽवले वाले पाके चातर्थ्यं सुद्धते।

<sup>्</sup>र दारणं नर्मा सन्यादिस्थिते चान्यव पाटनं ॥

<sup>&</sup>lt;sup>3</sup> त्रथनैते चारक्तत्या: । तदाथा दुर्व्यलवाल स्थिवर भीरुसर्व्वाङ्ग श्नोदिर रक्तिपित्त-गार्भिनृतुमती प्रवहज्वरि प्रमेहीर: चतचीनतृष्णा मूर्च्छीपद्रुतक्षीवापव्रचीवृत्त फलयोनय:॥ Susrnta Samhitā, I. xi.

अस्त्रानुग्रस्त्रेभ्यः चारः प्रधानतमच्छेदाभेदालीख्य करणाविदीषञ्चलाहिग्रेषिक्रयावचारणाच । Susrute Samhitā, I. xi.

<sup>\*</sup> Ibid. Hoernle's Trans. Bibliothica Indica.

भाखाय च दब्बींक्च शलाकानामन्यतमेन चारं पातयित्।

- 2. Śalākā or rods,—plain probes are mentioned for application of caustic lotions to parts of the body. But generally the ends of the probes are shaped like spoon. To this class belongs the three spoon-like probes of Susruta and the three nail-shaped probes of Vāgbhaṭa, described before.
  - 3. Kūreca,—it is a brush-like instrument.

The application of caustics has its advantages disadvantages; and these are to be considered in their relations to the pre-amesthetic periods of surgery. Patients are still less terrified by their application than by surgical incisions. The real value of caustics is thus summed up by Velpeau.2 "Nevertheless caustics possess some advantages which can not be denied them. As they do not give the idea of an operation, they shake less minds of the patients, they are accepted with more calmness and with infinitely less effort, than the action of the knife. Mortifying the tissues step by step, they give rise to no offusion of blood, and affect less deeply the economy than the operation, properly so called. Women treated in this way do not require to remain in bed or to consider themselves as patients. The dressings require little care, and do not demand The wound cleans absolutely the intervention of the surgeon. itself very rapidly in general, and once cleaned, it proceeds speedily towards cicatrisation. Without exempting wholly erysipelas, phlebites or purulent infection as some surgeons have asserted, there is notwithstanding, some reason for supposing that they expose the patient somewhat less to these troublesome complications than the operation".

<sup>1</sup> See P. 158-159.

<sup>\*</sup> Velpeau. Cancer of the breast. Marsden's trans.

#### 25. AGNI. ACTUAL CAUTERY.

Susruta says<sup>1</sup>: "With regard to surgical treatment actual cautery is said to be superior to caustics, in as much diseases treated with the actual cautery do not re-appear, as because it can cure diseases which are incurable by medicin instruments, and caustics." This partiality for cauteries is of the reasons of the gradual decadence of Hindu surgery as its total extinction in the present time. To this belief the Hindus may be compared the following aphorism Hippocrates<sup>3</sup>:—

"Those diseases which medicine do not cure, the knife cures; those which iron can not cure, fire cures; and those which fire can not cure, are to be reckoned wholl incurable".

For the application of the actual cautery the following articles are considered necessary<sup>4</sup>:—

- 1. Pippali or piper longum
- 2. Goat's dung
- 3. Teeth of a cow
- 4. Śara or saccharum sara
- 5. Probes or śalākā (see before<sup>5</sup>)

These are to be used for diseases of the skin.

<sup>3</sup> Ibid. Hoernle's Trans. Biblio. Ind.

Suśruta Samhitā, I. xii.

¹ चारादिप्रगैरीयान् क्रियासु व्याख्यातस्तद्दग्धानां रोगानीसपुर्णभावाह्वेषजगस्त्रचारिरसाध्यानां तत्साध्यतास । Susruta Samhitā, I. xii,

<sup>&</sup>lt;sup>5</sup> The Works of Hippocrates. Syd. Soc., vol. II., p. 774.

<sup>\*</sup> भधेमानि दहनोपकरणानि । तदाथा पिप्पत्यजाशक्तद्वोदन्त शरश्लाका जाम्बवीहेतर लीहाः चौद्रगुंड्वेहाय । तत्र पिप्पत्यजाशक्तद्वोदन्त शरश्लाकाल्वग्गतानां । जाम्बवीहे तर-लोहानि मासगतानां चौद्रगुद्वेहाः सिरसायु सम्यस्थिगतानां ।

<sup>5</sup>ee P. 159-60.

- 6. Jāmvavaustha<sup>1</sup>
- 7. Different kinds of iron

Used for diseases of the muscles.

- 8. Honey<sup>2</sup>
- 9. Treacle
- 10. Ghee
- 11. Oil

Used for diseases of the vessels, joints and ligaments.

"Both Actius and Oribasius represent goat's dung, pounded ith vinegar, as being equally efficacious as the sinapism, and pplying particularly to ischiatic diseases." Hippocrates says hat cauterisation may be performed with boxwood spindles ipped in boiling oil. In Kordofan, are used "El kamaia. rimitive instruments used for cauterisation consisting of a piece f camel's or sheep's dung dried and impaled on a long thorn."

12. Cautery knife.—This is to be used in the treatment of rolapse of the omentum in cases of abdominal injuries. The

Aştānga Hrdaya Samhitā, I. xxx.

मधुक्छिप्टेन तैसीन मञ्ज्ञचौद्रवसाष्टतै:।
 तप्तिर्वा विविधेसी स्टेन्डिक्टाइ विशेषवित्॥

Caraka Samhitā, VI. xiii.

- Adams' Commentary on Paul, vol. iii. bk. vii. sec. xix,
- . Hippocrates, ii. 482.
- \* Medical Practices in Kordonfan, Third Report. Wellcome Research aboratory, Khartoum.

मर्जी भगन्दरग्रियनाड़ीदृष्टत्रणादितु ।
 मांसदान्नी मधुकेड लाखवीष्ट गुड़ादिभि: ॥

prolapsed part is to be ligatured well and the cautery knife used to remove the prolapse below the ligature.

Cautery knife was also known to the Greeks and Romans Galen<sup>2</sup>, speaking of cancer, says that "some use heated razo blades, at once cutting and burning". Paul<sup>3</sup> also mention a sword shaped cautery in the radical cure of hydrocele.

13. Plates of copper, lead or iron.—In the application o both kinds of cauteries, plates of these metals are to be used to surround a tumour to prevent injury to the adjacent structure (Susruta).4

Hippocrates<sup>5</sup> in the treatment of nasal polypus, says tha "when that occurs we must insert a tube and cauterise with thre or four irons". Celsus<sup>6</sup> says that this tube may be a calamu or a tube of pottery.

14. Cakradatta mentions a probe of gold for applying actual cautery to the hair follicles after the removal of the eyelashes, to prevent a recurrence of trichiasis.

Albucasis similarly recommends burning the roots of hair

Suśrata Samhitā, IV. ii.

Susruta Samhitā, IV. xiii.

चदरान्मेदसो वर्त्त निगता यस दिहन:। कषायससम्बन्धनेषो वडा स्तेष स्ववित्। अग्रिततेन शस्त्रेषच्छिन्दान्त्रभसमायतं॥

<sup>&</sup>lt;sup>3</sup> Galen, xiv. 786.

<sup>&</sup>lt;sup>3</sup> Paul, vi. lxii.

यदल्यमुनं वपुताससीस पटे: समाविष्टा तदायसैका ।
 चाराग्रियकाष्य सकदिवदध्यात् प्राचानिहंसन् भिष्तृप्रमत्तः ॥

<sup>&</sup>lt;sup>5</sup> Hippocrates, ii. 244.

Celsus, vii. x.

<sup>&</sup>lt;sup>7</sup> See foot-note 2, p. 66.

in trichiasis with a probe of gold. Paul<sup>1</sup> applies a heated olivary probe or an aural probe for the same purpose. Haly Abbas and Rhazes also describe this operation.

## 26. Bheşaja or medicines.

This means such medicines as become necessary in the treatment of surgical diseases and do the work of surgical instruments to a certain extent. Susruta gives a list of medicines,2 required in the treatment of various kinds of inflammations, and I quote a few passages from the English translation<sup>3</sup> to illustrate the action of medicines in surgical practice. "Warm poultices made of the following drugs promote suppuration, namely, fruits of sana (Crotalaria juncea), Múlaka (Raphanus sativus), Sigru (Moringa pterygosperma), seasum and mustard seeds, flour of barley and wheat, kinva (the drugs used as a ferment in distilling spirits) and linseed. The following medicines are applied for opening abscesses, namely, chiravilva (Pongamia glabra), agnika (Semicarpus anacardium), chitraka (Plumbago Zeylanica), danti (Baliopermum montanum), hayamaraka (Nerium odorum), and the excrement of the pigeon, vulture and heron. Caustic alkalies are also very offectual in opening abscesses. Demulcent articles, such as, flour of barley, wheat or músha (pulse of Phaseolus Rux.) promote discharge from the interior of abscesses. \* \* \* \* Pastils for fumigating ulcers should be made of śriveshtatka gum of (Boswellia Thurifera), sarjarasa (resin of Shorea robusta), sarala (Pinus longifolia), and devadáru (Cedrus

<sup>1</sup> Paul viii. xiii.

<sup>&</sup>lt;sup>2</sup> See Suśruta Samhitā, I. xxxvi.

Dr. U. C. Dutt's Translation, Bibliotheca Indica. P. 151-154.

deodara); decoctions or cold infusions of astringent and unirritating barks should be used as washes for promoting granulations in ulcer. Tents for promoting granulations should be made of soma (Sarcostemna brevistigma), amrita (Cocculus cordifolias), asvagandhá (Withania somnifera), the plants included under the class of kákolyádi, and the buds of (Ficus Bengalensis)".

In treating inflammation, the Hindu surgeons used pastes to give relief to the pain and tension; warm poultices to promote suppuration; medicinal applications and incisions by knife for opening abscesses; demulcent articles to promote discharges; decoctions of drugs as corrective washes; tents of drugs and lints for introducing them into the cavities of the abscesses; decoctions in oils and clarified butter to improve the character of ulcers; pastils for fumigating sores; tents, pastes, powders and lotions for promoting granulations; drugs to repress high granulations; drainage to prevent infection, and bandages to give the part rest. This shows that the Hindus were not wholly ignorant of the antiseptic methods of treating wounds; and Susruta enjoins that a certain incense should be kept burning in the operation room.

Of the additions to the list of Susruta by Vāgbhata, we need consider the goat's gut only.

## GOAT'S GUT.

The intestines of the goats, etc. are to be dried and prepared as materials of ligature. They should be used in ligaturing fine vessels after incision by knife, evidently to check hæmorrhage.

<sup>&</sup>lt;sup>1</sup> See foot note 1, P. 223.

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<sup>&</sup>lt;sup>2</sup> See foot note 1, P. 223.

The use of goat's gut in surgery is generally considered to have been unknown to the Greeks and Romans, as it is not mentioned in their works. But Adams points out<sup>1</sup> "that the strings of ancient harp were made of the guts of a sheep," and this he clearly proves from a passage in the Odyssey of Homer.

Hippocrates<sup>2</sup> used apolinose made of crude flax, which is also mentioned by Paul for the delegation of arteries. Rhases however describes the use of strings of harp<sup>3</sup> as a material for suture in the operation called gastroraphé.

#### ARREST OF HÆMORRHAGE.

It is generally believed and often stated in modern works on surgery that the ancients were unacquainted with the proper treatment of hæmorrhage. Susruta however enumerates four different ways of arresting hæmorrhage after venesection; namely:

- 1. Sandhāna:—Contraction of the wound by astringent decoctions of Chebulic Myrobolan and the root-barks of the panchavalkala trees (five barks).
- 2. Skandana:—or thickening of the blood by the application of severe cold.
- 3. Pāchana:—or descicating or drying up the wound by ashes.
- 4. Dahana:—or cauterising the veius to make them shrink<sup>4</sup>.

<sup>&</sup>lt;sup>1</sup> See Commentary on Paul, VI. lii. vol. II, P. 345. Syd. Soc. Ed.

<sup>&</sup>lt;sup>2</sup> Hippocrates, iii. 132.

<sup>\*</sup> Rhases. Cont. xxviii.

चतुब्बिधं यदितिश्च क्विरस्य निवारणं ।
 सस्थानं स्कन्टनश्चेव पाचनं दहनं तथा ।

If the blood does not thicken by the application of cold, astringents should be applied; if these fail ashes should be used. By means of these three modes, the physician should endeavour to the best of his abilities to stop the bleeding, but if success be not still obtained, cautery may be resorted to as the absolute effective means. To stop bleeding from an artery, he advises us to apply astringents and pressure with the fingers. Vagbhata also describes these methods of arresting hæmorrhage, and advises us that if the ordinary means do not check the bleeding, the vessel must be again opened at a point in its course beyond the bleeding area, or actual cautery applied. Cakradatta also repeats these directions.

Vāgbhata however mentions the sheep's gut amongst the accessory instruments. His commentator explains its use for

वयः कषायः सन्यत्ते रक्तं स्वन्दयते हिमं। तथा सन्याचयेद्वस्य दाहः सङोचयेत् सिराः॥

Suśruta Samhitā, I. xiv.

भिक्तन्दमाने विधिरे सन्धानानि प्रयोजयेत्। सन्धाने अध्यमाने तु पाचनैः समुप्रचारेत्॥ कल्पेरेतेखिभिवेदाः प्रयतित यथाविधि। असिद्विमत्मु चैतेषु दाष्टः परम् इष्यते॥

Ibid.

रतो लिति हित चिप्रं सम्भनीमाचरेत् किया म् । स्तोत्र प्रियङ्ग पत्तङ्ग माष्यध्याङ्ग गोरिकै:॥ स्तकपालाञ्जनचीम मधी चीरीलगङ्गे:। विचूर्णयेद त्रणसुखं पद्मकादि हिनं पिवेत्॥ सामेव वा शिरां विध्येद्याधात् तक्यादननारं। शिरासुखं वा लिरितं दहेत् तप्तश्चाकया॥

Astānga Hrdaya Samhitā, I. xxvii.

See Cakradatta, Širāvyādhādhikāra.

ligaturing blood-vessels<sup>1</sup>. Susruta says that if in venesection, or in treating wounds, excessive bleeding occurs, it should be stopped by proper means<sup>2</sup>.

Celsus<sup>3</sup> advises us to fill up the wound with dry pledgets, then to apply a sponge squeezed out of cold water and to press with the hand. If not successful, cut the vessel asunder between two ligatures, or apply cautery, or try the method of revulsion. Galen<sup>4</sup> applies pressure by finger on the wounded vessel, or twists it moderately. If the vessel be an artery, he gives the alternative of a ligature or cutting across. Paul<sup>5</sup> mentions all the methods to stop the bleeding, viz., pressure, styptics, ligature, escharstics, and cauteries with fire.

Albucasis mentions four methods of stopping the discharge of blood from an artery:

- 1. By cautery.
- 2. By dividing the artery across.
- 3. By using the ligature.
- 4. By styptics and bandage.

Avicenna7, Rhases8 and others also mention these methods

तेसोर्झिमत्तेर्वेष्ट्रधा ग्रोनित प्रसृते स्ट्रं ।
 कार्स्थं यद्योक्तः वैदोन ग्रोनितस्थापनं भवेत्॥

Suáruta Samhitā, IV. i.

<sup>&</sup>lt;sup>1</sup> अन्तं निवादीनां ग्राप्तान्तं ताद्दत्स्थातं शस्त्रक्केदानन्तरं स्वाधिरादिवश्वनादिष्ठै युज्यते । Vägbhaţārtha Kaumudī, I. xxv.

Celsus, v. 26.

Galen, Meth. Med. v.

Paulus Ægineta, IV. lii. vol. II. P. 127. Syd. Soc. Ed.

<sup>•</sup> Albucasis. Chirrug. i. 58.

Avicennæ Cantic. ii. 2., and Collig. vii. 23.

<sup>\*</sup> Rhases, Divis i. 39; Contin. xxviii.

for arresting hæmorrhage. Thus it becomes apparent that the use of ligature for stopping bleeding was well known to the ancient surgeons and the present methods of arresting bleeding are only the revival of the old practice. Adams¹ concludes: "It appears, therefore, that the use of the ligature for stopping hemorrhages was well understood by the ancients, and had never been lost sight of even in the darkest ages."

<sup>&</sup>lt;sup>1</sup> Adam's Commentary on Paul, vol. II. p. 132.

### CHAPTER VI.

# THE SASTRA OR THE SHARP INSTRUMENTS.

1. THE MANDALAGRA OR ROUND HEADED KNIFE.

It is described as a round or circular headed cutting instrument, having a length of six anguli. Two sub-varieties are noted —one with a circular edge and the other shaped like a razor (Dallana).¹ Vāgbhaṭa², however, describes the blade to be shaped like the index finger when its nail points towards the palm of the hand. This would then resemble the decapitating hook of Ramsbotham.

It is said to have been principally used for the operation of cutting through and scraping<sup>3</sup>; so it is recommended to be used

- मण्डलिमवायं यस्य तत् मण्डालायं तच विविधम् तथान्ति— यद्गे मण्डलं इतं चुर संस्थानमेव वा । मण्डलायस्य जानीयात् प्रमाणन्तु षङ्झुलम् । Nivandha Sangraha, viii.
- मण्डलायं फले तेषां तर्जन्यन्तनेखाक्तति। लिखने केदने योज्यं पोथिकौ ग्रुष्डिकरदिष् ॥

Aştānga Hrdaya Samhitā, I. xxvi.

मण्डलायं, मण्डलायं नाम शस्त्रं, फले, फल प्रदेशे, तजेन्यन्तर्नखाक्वति स्वात्, श्रनः, श्रन्तिं नखः, श्रन्तर्नखः, तर्ञ्जन्या श्रन्तर्नखः तर्ञ्चन्तर्नखः, तस्वेवाक्वति राकारो यस्य तत् तर्ज्ञन्यन्तर्नखाक्वति। तञ्च पोषकौ गलग्रस्डिकादिष्ठ, लेखने, लेखन कर्माण, तथा हेदने, हेदन कर्माण, योज्यं।

Vāgbhaṭārtha Kaumudī, I. xxvi.

- फलोह्रेशे तर्जन्या चन्तर्नखसर्जन्यन्तर्नखसस्येवाक्तिर्यस्य तदेवम् । Sarvānga Sundarī, I. xxvi.
- तत्र मण्डलायकरपत्रे स्थातां केटने लेखने च।
   Şuáruta Samhitā, I. viii.

in the operative treatment of enlarged tonsil<sup>1</sup>. It is also advised to be used for piercing the skull of a dead feetus in utero to help its easy extraction by other instruments. So any other presenting part causing difficulty in the delivery of the dead feetus, is to be cut with it. It is claimed that there is less likelihood of damaging the soft parts of the mother by this instrument than by the sharp pointed vyddhipatra.<sup>2</sup>

We find that Suśruta recommends a mandalāgra knife in ophthalmic practice for scraping away the membranous expansion in the operation of pterygium<sup>3</sup> and other ophthalmic operations,

> भङ्गुष्ठाङ्गुलिसन्दंशिनाक्षथ गलग्रिष्डिकां। छेदयेन्यख्डलाये ण जिह्नोपरि तु संस्थिताम्। नोत्कष्टचेव हीनच तिमागं च्छेदयेदिषक्॥

Suśruta Samhitā, IV. xxii.

ै तन स्त्रियमात्रासा मख्डलाये चाङ्गुली यस्त्रेण वा शिरो विदार्थ्य शिर:कपालान्याद्वत्य यङ्गुना रहोत्नोरिस कचायां व्यपहरेदिभिन्नेशिरिस चाचिकूटे गख्डे वा भंससंसक्तस्यांसदेशे बाहुं हित्ता द्वतिमिवाततं वातपूर्णीदरं वा विदार्थ्यं निरस्थान्ताणि शिथिजीसृत माहरेज्ञघनसक्तस्य वा जघनकपालानौति।

> यदः, यदः हि गर्भस्य तस्य स्वजित ति विष्कृ । सम्यग्विनि हैरेन्स्ति त्वा रचेन्नारीच यवतः । गर्भस्य गतयस्विता जायन्तेऽनिलकोपतः । तचानाल्पनि विवेद्यो वर्त्ते त विषिपूर्व्वनं ॥ नोपचेत चतं गर्भं मृहुर्त्तं मि पिष्डितः । सन्त्राग्र जननीं हिना निरुच्छासं पग्रं यथा ॥ मण्डलाये य कर्त्तं वर्षे द्वियमनिर्विजानता । इडिप्रवं हि तीचायं नारीं हिस्सात् कदाचन ।

> > Ibid, IV. xv.

अश्रं यत बलीजातं तत्ते तत्त्वगयेद भिषक् ॥ अपाइः प्रेचमाणस्य विक्रीन समाहितः । सुचुष्प्राग्टचा नेघावी स्वीर्द्धेण वा पुनः ॥ नचीत्वाप्यता चिप्रं कार्यमस्य कृतं त तत् । such as for vascular net-work and nodules on the eyeball<sup>1</sup>. Cakradatta says<sup>2</sup> that if the pterygium extends to the black part of the eye, the membrane is to be raised by the point of a needle, transfixed by a vadiša or hook, and leaving the pupil free, is to be excised, as Sivadāsa<sup>3</sup> explains, by the mandalāgra. He also uses it to scrape away the root of any new growth in the eye<sup>4</sup> and to perform the operation of scratching in ophthalmic surgery<sup>5</sup>.

शस्त्रपातभयाचास्य वत्म नी याच्चयेद दृढं।।
ततः प्रशिथिलीभूतं विभिरेव विलम्बितं।
उक्षिखन्मण्डलाग्रेणः तीच्यो न परिशोधयेत्।।
विमुक्तां सर्व्यतयापि क्षणाच्छुकाच मण्डलात्।
नीला कनीनकोपान्तं किन्याद्राति कनीनकं।।
चतुर्भागस्थिते नांसे नांचि व्यपत्तिमर्हति।

Suśruta Samhitā, VI. xv.

विराजाले सिरायासु कठिनासाञ्च बुहिमान्। डिझखेन्यच्छलाग्रेण विष्मिनावलिक्तः॥ सिरासु पिड़काजाता या न सिध्यन्ति भेषजैः। अर्थवन्यच्छलाग्रेण तासाञ्छेदनमिष्यते॥

Ibid.

श्चर्म तु च्छेदनीयं स्थात् क्षच्यप्राप्तं भवेद्वयदा। विष्यविद्वसुत्रस्य विभागञ्चाव वर्ज्जयेत्॥

Cakradatta, Netraroga Cikitsā.

- ै चर्चक्रेव्हेदनीयिनिति मण्डलाग्रेणेति श्रेष:। समुद्रम्येति स्चग्रेणेति श्रेष:। स्चग्रेण समुद्रम्य उत्तील्य जनन्तरं विड्रिशेन विड्डा मण्डलाग्रेण क्वेदयेदित्यर्थ:।
  - Tattva Candrikā, Netraroga Cikitsā.
  - \* श्रमंस्रधावत्मं नामा ग्राजार्थोऽर्ब्द्रमेव च।
    मण्डलागे य तीच्यो य मूलेच्छिंन्दाद भिषक् शनै:॥
    Cakradatta, Netraroga Cikitaā.
    - भित्वोपनाइं कफ्जं पिप्पली मधूसैन्धवै:।
       विलिखेन्मण्डलाग्रेण प्रच्छियहा समन्तत:॥

A small instrument with a broad blade and a rounded cutting tip is figured by Albucasis1 in connection with ophthalmic work. This was the scalpel for the plastic operation on the eyelid as for trichiasis. Incisions were made by this knife on the eyelids in such a way as to enclose a leaf-shaped area which was then dissected off. The lips of the incisions were then united with three or four sutures2. Paul3, quoting Actius4, describes the operation for pterygia :-- "Having separated the eyelids, and seized upon the pterygia with a hooklike instrument, having a small curvature, we stretch it, and taking a needle having a horse-hair and a strong flaxen thread in its ear (eye?), and a little bent at the extremity, we transfix it through the middle of the pterygium, and with the thread we bind the pterygium and raise it upwards, while with the hair we separate and saw as it were the part at the pupil away unto its extremity; but the remainder of it at the great canthus we cut off from the base with the scalpel used for the operation by suture, but leaving the natural flesh of the canthus, lest there be a running of the eye when it is taken away. Some stretching as aforesaid with a thread, dissect away the whole pterygium with the instrument called pterygotomos, taking care not to touch the corner."

Cakradatta mentions the use of the mandalagra for scarifying

घतसैन्यव चूर्येन कपानाइं पुन: पुन:। विलिखेन्यरङ्लाग्रेण प्रच्छयेदा समन्तत:॥

Cakradatta, Netraroga Cikitsā.

<sup>&</sup>lt;sup>1</sup> Milne. Græco-Roman Surgical Instruments, Pl. ix. fig. 3.

<sup>&</sup>lt;sup>2</sup> Paulus Ægineta, VI. viii.

<sup>&</sup>lt;sup>3</sup> Tbid, VI. xviii.

<sup>\*</sup> Actius, II. iii. 60,

the tongue for bleeding in the disease called jihvākantaka (prickly tongue). He also uses it in adhijihvā or ranula and says: "The tongue is to be raised, the ranula is to be drawn up and fixed by a sharp hook, and then excised by the mandalāgra. Afterwards a strong gargle is to be prescribed". Pālakāpya also describes it to have a length of nine anguli, the handle being six, and the blade three anguli long. The end is full-moonshaped and it is directed to be used for scarification on the eyeball.

It seems that mandalagra of different sizes and shapes were used. For the instrument used for perforating the feetal cranium in uterus would scarcely be thought fit for a delicate operation on the eyeball.

Soranus <sup>4</sup> mentions a special instrument for perforating the feetal head. Rhases <sup>5</sup> directs us to open the head when the child's cranium is large and cannot be brought down. Haly

¹ नग्दनेषु निर्माखेषु निखितिष्यस्त्रः घरी।
पिपल्यादिर्मधुर्यतः नार्थन्तु प्रतिसारणम्॥

Cakradatta, Jihvāroga Cikitsā.
निखितिष्यिति मण्डलाग्रादिना।

Tattva Candrika, Ibid.

उन्नास्य जिङ्वामाक्रस्य विज्ञिनाधिजिहिकाम्।
 हेदयेन्त्रस्डलाये च तीच्चीचैलंवचादिभि:॥

Cakradatta, Mukharoga Cikitsā.

शिखनं मण्डलाप्रेण कर्त्तं व्यं दिन्तिनां भवेत्।
 Pālakāpya, III. i.
 पूर्णवन्द्राक्तव्यायमण्डलायम शिखनार्थमच्यो।

Pālakāpya, III. iii.

- \* Soranus, II. viii., P. 366.
- Rhases, Cont. xxii.

Abbast also advises us to open the head when it is preternaturally large. Actios? also gives a similar discription. Some authors recommend the polypus-scalpel or the phlebotome in embryotomy. The embryotome figured by Albacasis? is a straight two-edged blade, and we may conjecture that the mandalagra used by the Hindus for perforating the fietal eranium was a similar instrument.

#### 2. Karapatra or san.

It literally means, "an instrument having the blade in the form of a hand", the fingers being represented by the teeth of the saw. Others explain, as Dallana's points out, the name from its resemblance to a carpenter's saw. It seems that saws of various sizes were used. Sugarta mentions its length to be six anguli, Vägblanta's describes it to be ten anguli

Nivamilla Sathgraha, I. vill.

विदेऽम्यां करपतन्तु स्वरधारं दलामुले।
 विकारि दालुलं नुकादनां स्वत्यद्व वस्त्रं॥

Aşfanıra Hydaya Samblita, f. zzvi.

करपत्राच्यां याजनाड केंद्रे डत्यादि करवत् पत्र वस्ता तत् करपत्रं, चक्रुजिति राचिती यणकारी भवति तदत् वत् कच्छकराचितं तत् करपत्रमुच्चते । करपत्रं करपत्रं करात् क्यात् कार्यः वस्तात् कार्यः करपत्रं करपत्रं करपत्रं करपत्रं करप्तं, करा, तीच्या, धारा वस्ता तत्रवाविषम्, तथा वस्तानुकान्,

<sup>1</sup> Huly Alders, Pract. iv. 57.

Actios, XVI, 23.

<sup>\*</sup> Grass Roman Surgical Instruments, 19, vin hig T

<sup>&</sup>quot; करपनिति करवत् पतं करपने धवा करोऽह निधिराधितो अनित तरत् धत् कद्यक्षेराचितं स्नात्तत् करपनम् भतः चर्कत् त् करपनम् क्षे सरपनाम् करपनाम् करपनम् स्वादमाह के
तन्त्रानार वचनात्। नत् पति तन्त्रानामान द्वादमाह के करपनम् भति नहिं स्नान्ते विद्योधः
स्नाः स्नाने करपनस्य निर्देशमाणनान् क्षेत्रानि त् वद्यह नानि दस्यमेन वाक्षेत्र वद्याह समेद
सरपनम् स्थात दादमाह ने नेवस् नवास् नामाभिरवास्तर्यः प्रार्थेण स्थानाताः दस्यकात् सृजात्
प्रायः स्वीऽनुवर्तां नेतेनायम्यं, स्वानि प्रायेण वद्यह नानि एवं स्वस्नाने दस्यक्षाविद्येषः ।

long and two anguli broad; while Bhoja<sup>1</sup> alludes to a saw, twelve anguli long. The edge of the instrument is described as rough and serrated; and this is the only instrument that need not have a very sharp edge.

The handle of the saw should be well formed and pegged.

Its principal use is to saw a bone. Sometime it is recommended

for the purpose of scraping.

Saw is frequently mentioned by the Greek and Roman authors in the descriptions of operations on the bones. Celsus mentions it in describing the amputation of a gangrenous limb. With reference to fractures of the bones of the head, Paul says<sup>3</sup>: "But the mode of operating with saws and the instrument called chemicides or modioli (trepans?) is condemned by the moderns as a bad one." Evidently he means flat cranial saws. Galen<sup>4</sup> also mentions the "knife-shaped saws."

In modern times the saw is still used for identical purposes in surgery.

There is no mention of trephine in Hindu surgery though Jīvaka (500 B.C.) is said to have practised cranial surgery with success<sup>5</sup>. Pandit Vallala describes<sup>6</sup>, in his Bhojaprabandha or

Vāgbhatārtha Kaumudī, I. xxvi.

<sup>&</sup>lt;sup>1</sup> See foot-note 4, P. 230.

<sup>&</sup>lt;sup>2</sup> Celsus, VII. xxxiii.

<sup>&</sup>lt;sup>3</sup> Paul, VI. xc.

<sup>4</sup> Galen, XVIII. 331.

<sup>&</sup>lt;sup>5</sup> See Mahāvāgga, VIII. 1.18. Sacred Books of the East. Vol. xvii.

See foot note 1, p. 60.

Annecdotes of King Bhoja, a surgical operation performed on the king. He was suffering from a severe pain in the head. Medicines did him no good, and so to give relief, surgical interference was thought necessary by two brother surgeons who happened to arrive in Dhar at that time. They are said to have administered a drug called sammohini to render him insensible. They then trepanned the skull and removed the real cause of his complaint. They closed the opening, stitched the wound and applied a healing balm. They are then said to have administered to the king another drug called safijibani to accelerate the return of consciousness.

Trephine was well known to the ancient Greeks and Romans. Hippocrates<sup>1</sup> mentions a trephine or a saw having a circular motion, in the treatment of injuries to the head. Paul also mentions trephine, the use of which is, he says, condemned by the moderns. Sprengel<sup>2</sup> remarks, that "Galen was averse to the use of the trepan, though he performed the operation on the head occasionally."<sup>3</sup>

# 3. VRDDHIPATRA.

This sharp cutting instrument is called vrddhipatra from its resemblance to the leaf of a medicinal plant called vrddhi. Two varieties of this knife are described by Vāgbhata4—one is

Astānga Hrdaya Samhitā, I. xxvi.

<sup>&</sup>lt;sup>1</sup> Hippocrates, III, 371, 374.

<sup>&</sup>lt;sup>2</sup> Hist. de la Méd., 18.

Adam's Commentary on Paul, VI, xc. Vol. ii., p. 436.

शिखपतं चुराकारं छेद भेदन पाटने। च्छन्यग्रमुखते शोफ गन्भौरे तु तदन्यथा। नतागं प्रष्ठतो दीर्षं इस्ववक्कं यथायथं॥

straight throughout and it is to be used for opening pointed superficial abscesses; and the other has the end bent or curved. Again amongst the second class of curved knives, some have their ends long and therefore called dirgha-vaktra or long-mouthed, and these are to be used for opening the deep seated abscesses, while others have their ends short and therefore called hrasva-vaktra or short-mouthed, and these are to be used for superficial abscesses that would not point. Sufruta describes them to be six anguli long. Dallana in his commentary says:—

Both the varieties, one with a curved,—and this is called a kṣura or razor,—and the other with a resected point, should be seven anguli long; the handles and the blades should measure five and a half and one and a half anguli respectively." These are to be used for cutting through a part, partially or completely, and also for puncturing it.

हिंदिपताख्यां सस्त्रमाह हिंदिपतिमित्यादि हिंदिपतं नाम सस्त्रं, चुराकारं, चुराकृति, चुरस्त्र लोमच्छेदकः सस्त्रिविशेषो नरमुन्दराणां। तस्त हिंदिनानीष्य हचस्य पत्रसद्देश फात्रक वात् हिंदिपताख्यां लभते। तद्द हिंदुपतं नाम सस्त्रं छेदे भेदने पाटने च कर्क्षाण योज्यमिति च्रज्वयमित्यादिना विषय विशेषे हिंदि पत्रस्ताकार भेद उच्चते। यत् हिंदिपनं च्रज्वयं सरकार्यभागं, आयतायिमत्ययं:। तत्, उन्नते, उच्चिते, शोके, शोषे, योज्यं। गम्भौरे, भेद आदि धातुः शोफी, तया तदन्यया, अनुन्नते च शोफी, यत् पृष्ठतः, प्रस्त्रदेशे नतायं वक्तीभूतार्यभागं, कुच्चितार्यमित्ययं:। तत् हिंदिपनं शस्त्रं यथाययं दीर्घ इस्त वक्षां, दीर्व सुखं, इस्त सुखं वा योज्यं। यथाययं निति गम्भीरे शोके दीर्घवक्षं, अनुन्नते च शोके इस्ववक्षमित्यर्थः। यत दिविधं हिंदिपतं सस्त्रयुक्तम्, दे भिष् सताङ्गुल प्रमाणे, द्योरिष अर्थपञ्चाङ्गुल हन्नं कार्थं सार्षाङ्गुलद्यं फलमिति। भेदनंः, भेदं, एकिसान् शारीरदेशे सस्त्रमावगाद्य सपर दिशा सस्त्रायसा निक्ताश्चनं भेदनं। पाटनं, विदारणं फाड़न द्वित लोके।

Vägbhatartha Kaumudī, I. xxvi.

<sup>े</sup> विश्वपत्रमिति, वर्षे: पत्रमिव वृद्धिपत्रं तम्र दिविध एकं अश्वितागं, दितीयं प्रयतागं, दे अपि सप्ताङ्गल प्रमाणे द्योरिप अर्थ पश्चाङ्गलं वन्तं कार्ये सार्वाङ्गलम् फलम् दित अनयोग्धिये अश्वितागं वृद्धितं चरमाहः।

One form of the vriddhipatra resembles in shape the razor used by the barbers,—not the English razor that has now become common in Bengal, but the country-made razors which are still used by the barbers in the North-West Provinces.

Susruta recommends the use of razor, scissors and pinchers for shaving the parts before operation; for "the hairs", he says, "prevent the healing up of the wound rapidly". He again uses viddhipatra as a knife and observes:—"If bitten by spiders whose bites are amenable to treatment, the area of the wound should at once be excised out by the viddhipatra, and then actual cautery applied by the red-hot jāmvavaustha probe till the patient requests for its withdrawal".

Susruta uses the viddhipatra knife for the removal of the scrotal tumour and says<sup>3</sup>: "The scrotal tumour is to be well fomented and bandaged. The patient should then be cheered up, and leaving the testicles intact, underneath the median raphe, the tumour should be excised by viddhipatra knife. The fatty tisues being

Suśruta Samhitā, IV. i.

Ibid, V. viii.

शिक्रां चावेष्टा पहेन समायासातु मानवं। रचेत् फले सेवनीच इज्जिपतेण दारयेत्॥ मेदसत: समुजुत्य दद्यात् कासीससैन्यवं। वधीयाच यथीद्दिष्टं।

रोमाकौर्णी व्रणो यस्तु न संयगुपरोद्गति। चुरकर्भरीसन्दंशे सस्प्ररोमाणि निर्इरेत्॥

माध्याभिराभिनुताभिर्देष्टमावस्य देहिन:। इडिपवेण मितमान् सम्यगादंशसुङ्करेत्॥ जाम्बर्छेमाग्नि तप्तेन दहेदाकर वारणात्।

removed, powdered ferri sulphas and rock salt are to be dusted over the wound and proper bandages applied."

Vṛddhipatra was also used by the ancient veterinary surgeons. Joyadatta Suri writes<sup>1</sup>: "The knife known as vṛddhipatra is shaped like a kṣura or razor. It is three aṅguli long and should be used by the wise to incise a suppurated abscess". In Pāla-kāpya<sup>2</sup>, we find that "it is ten aṅguli long; the handle being six aṅguli and the blade four aṅguli long and three aṅguli broad. It is used for scission and excision". He uses it also in opening a sinus after well ascertaining its course by means of a probe<sup>3</sup>.

Hypodermic medication:—The use of hypodermic syringe was not known to the Hindus. They were acquainted however with the hypodermic method of exhibition of drugs. Sārngadhara<sup>4</sup>

वाङ्गलं बिडापतस्य चूराकारं प्रकीर्तितम्। पक्षशोधादिषु प्राज्ञ: पाटनं तेन कारयेत्॥

Aśvavaidyaka, XIV. v. 22.

शस्त्रेण इहिपत्रेण वाऽसि(शि)तेन सि(शि)तेन वा।
 शस्त्रकर्मणि निष्पात: सुपक्कं पाटयेडिषक॥

Pālakāpya, III. iv.

इंडिपवेश नागानां कुर्याच्छेदन भेदने।

Pālakāpya, III. i.

- ³ षण भिष्णयन्त्राधायोक्तेन विधिना सुयन्तितं वारणमभिविश्वाखाऽऽग्र्(श्रि)त्य सम्भानुगतं गितमन्तं खल्पसुखं नाडौब्रणमेषणया च विदित्वा इडिपब्रेण शस्त्रेणानुलोमं पूपप्रति,रणार्थच्छेदं कुर्व्यात्॥
  - Pālakāpya, III. xv.
  - प्रचिव वा चुरियाङ्ग नेवलानिलपीडितम्। तव प्रदेषं ददाव पिष्टं गुझाफलें: क्रतम ॥ तेनाववाङ्गा पौड़ा विषची ग्रथसी तथा। प्रन्यापि वातजापीडा प्रथमं यति वेगतः॥

Śārngadhara Samgraha, III. xi.

directs us to scarify a part with a razor and then apply an ointment of guñjā (Abrus precatorius) in sciatica, scrofulous glands of the neck, etc. For treating a person in the state of naconsciousness caused by the derangement of all the humours, he directs us to scarify the anterior fontanelle with a razor, then to apply as much medicine as can be carried on the point of a needle to the part and rub it with fingers. The medicine is to be prepared thus:—take aconite I pala, quicksilver I sāna; mix, and put inside two sorābas or eartheu basins smeared with powdered glass and placed face to face. Apply some external application over this and put it on fire for six hours. Then open the basins, take the soot collected on the upper basin and deposit it in a glass vessel quickly to prevent exposure. Caraka<sup>2</sup> also advises us to apply a medicinal paste on a cranial incision, shaped like

Śārngadhara Samgraha, II. xii.

र विषं पलिमतं स्तः शाणिकसर्णयेह्यम्।
तस्णं सम्पूटे च कला काखिलिससरावयोः॥
सुद्रां दत्ता च संशोष्य ततस्वद्धां निवेशयेत्।
बिर्क्तं शर्नेः श्रेनः कुर्यात् प्रहरहय संख्या॥
तत जलाव्य तनसुद्रासुपिरियो सरावकी।
संलग्नो यो भवेडूमः तं ग्रक्तीयाच्कनैः श्रनैः॥
वायुस्पर्शीयथा नस्प्रात् ततः कुष्यां निवेशयेत्।
रसः स्चीसुखेलग्रस्तूष्या निर्याति सेषजम्॥
तावन्याचो रसो देयो मृच्किते सिन्नपतिनि।
चुरेण प्रकिते मृष्ट्रिं तदङ्ख्या च घर्षयेत्॥
रक्तं भेषज सम्पर्कान्सुच्छितोऽपि हि जीवति।
तथेव सर्पदंष्टस्तु स्तावस्थोऽपि जीवति।
यदातापो भवेत् लस्म मध्रं तल्न दीयते॥

विषट्षित कप्तमार्गः स्रोतसंरोधरङ्गवायुषः।
 स्तद्व प्रसेकार्यः स्रादसाध्यलिङ्गेविङ्गीनयः॥

the foot of a crow, in case of snake-bite when he becomes unconscious but his life is not completely despaired of.

# 4. NAKHA ŠASTRA OR NAIL PARER.

Suśruta¹ mentions its length to be eight aŭguli. Dallana² says that its blade is two aŭguli long and one aŭguli broad. Vägbhaṭa³, on the other hand, describes the length to be nine aŭguli. Aruṇadatta⁴ thinks it to be a double instrument, one end having a straight edge and the other an oblique one. Some explain⁵ that two different kinds of nakha ŝastra—one with a straight and the other with an oblique edge—are directed to be used.

चर्माकंषायाः काल्कं विल्तसमं मूर्षि काकपदमसा । इत्वा कुर्य्यात् कटभीं कटुकोटपाला प्रथमनश्च ॥ Caraka Samílitā, VI. xxv.

<sup>1</sup> तत नखशस्त्रेषण्यावष्टाङ्गुली स्चीवत्यन्ते।

Susruta Samhitā, I. víii.

³ नखशस्त्रमिति नखानां केदनाय शस्त्रं नखशस्त्रं तस्त्र फलं दाङ्गुलायामम् एकाङ्गुल विस्तृतम्।

Nivandha Samgraha, I. viii.

वक्रज़्रीधारं हिसुखं नखगस्त्रं नवाङ्गुलं।
 स्वागल्योड्तिच्हे देवेद प्रच्छान लेखने॥

Aşţāṅga Hṛdaya Saṁhitā, I. xxvi.

- \* नखगस्त्रं नखच्छेदनं प्रसिद्धं। तश्च वक्षा म्हजूबधारा यस तदेवन्। तसेनं भुखं वक्रमन्यदनु स्पष्टम्। Sarvängasundari, I. xxvi.
- 5 नखशस्त्रमाह वक्षजीधारिमशादि नखाना छिदनाय शस्त्रं नखशस्त्रं तत् विसुखं वि दिः प्रकारं सुखं यसा ति इसुखं तथा वक्षजीधारं एकं वक्षं धारं भपरम् सम्जुधारं सात्, तथा नवाङ्गलं उभयोमि दे व्येण नवाङ्गलपरिमितं तस्र नखशस्त्रं शख्योषुत्यादौ योज्यं शख्यानां क्यटकदीनासुबृति रहरणं शख्योषुतिः प्रकानं चेरा इति यसा प्रसिष्टिः लेखनं चांचन् इति लोके।

  Varbhatartha Kaumudī, I. xxvi.

They are principally recommended for cutting, puncturing and scarifying<sup>1</sup>; and also for the extraction of needles and minute foreign bodies from the soft parts.

There is no mention of a many-bladed scarificator in the surgical books of the Hindus, but its office was performed by the nakha sastra, in wet cupping, by making parallel incisions close to one another.

Paul<sup>2</sup> alludes to an instrument compounded of three blades joined in such a way that at one stroke, three scarifications were made; but he prefers a single scalpel for the purpose.

Pālakāpya mentions an instrument called rampaka<sup>3</sup>, having the handle ten anguli and the blade three anguli long. It is to be used for paring the nails and cleaning the feet of the elephants.

#### 5. Mudrika.

It is described to be a cutting instrument of the size of the last phalanx of the index finger<sup>4</sup>; it is also called anguli-sastra or finger-knife. Vāgbhata describes this instrument but not clearly. He says that the mouth of the anguli-sastra looks as if coming out of a ring, and the blade is half an anguli wide. A ring, having the size sufficient to admit the terminal phalanx of the index

Susruta Samhitā, I. viii.

Pālakāpya, III, xxx.

¹ हिंदपत नखगस्त सदिकोपलपदकाई धारानि छेटने भेटने।

<sup>&</sup>lt;sup>2</sup> Paulus Ægineta, VI. xli.

<sup>🍍</sup> रम्पकस्त्राङ्गुलमुखी दशाङ्गुलवृत्त पादशीधनार्यं नखक्छेदनार्थे चेति।

प्रदेशिन्यगपर्व्वप्रदेशप्रमाणासुद्रिका ।

finger, should be soldered to it. The base of the instrument has a thread tied to it.

It is recommended to be used for cutting through neoplasms in the throat. In its uses, Vāgbhaṭa says that it resembles the maṇdalāgra and vṛdidhipatra; and so was sometimes required for perforating the skull of a dead fœtus in the uterus of its mother<sup>2</sup>.

Dr. Simpson of St. Andrews (1744) is said to have invented an instrument, a "ring scalpel" for opening the skull. It consists of a loop of steel, through which the finger is to be passed

कुर्यादङ्खिशस्त्रकं।

सुद्रिकानिर्गतसुखं फलेळक्षां सुलायतं। योगतो इिद्यप्रतेण मण्डलायेण वा समं। तत्प्रदिशिन्यय पर्व्वप्रमाणापेन सुद्रिकम्। सुत्रवक्षं गलकोतो रोगक्षेदन भेदने॥

Aştānga Hrdaya Samhitā, I. xxvi.

कुर्यदित्यादिना मङ्गुलिगस्त्रकं व्यक्ति। सुद्रिका मङ्गुरीयकेण निर्गतं निष्कृत्तं सुखं यस्य तत्त्रथाविधं सुद्रिकानिर्गतसुखं तथा फले फलोह् ग्रे मडेडङ्गलायतं मडेङ्गुम्मान विस्तारं मङ्गुलि ग्रस्त्रकं मङ्गुलिनाम ग्रस्तं कुर्यात्। तञ्च योगतः प्रयोगे इिष्ठपत्नेण मण्डलाग्रेण वा समतुल्यं भवति। लेखने च्छेदने इिड्रपतवत् योज्यं किस्वा छेदन भेदून पाटने मण्डलाग्रवत् योज्यमित्यर्थः। तदित्यादि तदङ्गुलि ग्रस्त्रकं प्रदेशिन्यग्र पर्व्यप्रमाणापण सुद्रिकं कुर्यादिति योज्यं। वैद्यस्त्र प्रदेशिनी नासी मङ्गुलि सस्त्रा मग्रं यत्पर्व्व तत्त्रथा तस्त्र यत् प्रमाणा परिमाणं तदर्गणा तत् प्रवेशोपयुक्ता सुद्रिका यस्त्र तत्त्त्रथाविधं। सुद्रिका सुदरी भाङ्गी इति वा ख्याता। तथा सूचवर्षं सूलदेशे सूचे एवड्ं तच्च गलस्रोतो गतानां रोनाणां छेदने भेदने च योज्यं।

Vāgbhaṭārtha Kaumudī, I. xxvi.

श्विष्कश्ची नाम तौ सूदी श्रस्त्रदारणमहैत:। सख्डलाङ्गुलि शस्त्रास्यां तत्रक्तस्य प्रशस्ति। इद्विपतं हि तौच्चार्यं न योनादवचारयेत्॥

Aştānga Hrdaya Samhitā, II. ii.

and from which protrudes a sharp pointed blade about an inch long, by which the cranium was pierced<sup>1</sup>.

In the pseudo-Hippocratic treatise<sup>2</sup> a knife to fix on the thumb and dismember a fœtus in utero is mentioned. This knife is called by Turtullian<sup>3</sup> the "ring knife", whereby the limbs are advised to be cut off in the womb. It is intersting to point out that mudrikā also means a ring.

The veterinary surgeons still use a scalpel blade mounted on a ring<sup>4</sup>, through which a forefinger is passed to dismember foals and calves in exactly the same way.

### 6. UTPALAPATRA.

This knife is described to have the shape of a petal of the blue lotus. The end is long, sharp and pointed. The utpalapatra is dīrgha-vaktra or long bladed, while the arddhadhāra is the hrasva-vaktra or short bladed knife<sup>5</sup>. It is to be used for cutting through and puncturing the parts.

### दीर्घ ऋखवर्क्ष यथायथं।

# उत्पनाध्यई धाराख्ये भेदने छेदने तथा।।

Aştānga Hrdaya Samhitā, I. xxvi.

चललपताव्यध्यर्षधाराव्ये शास्त्रे बाह उत्पत्तिव्यादि उत्पत्तव्य श्रध्यर्षधारस्र ते बाव्ये ययोः शक्त्रयोः से उत्पत्ताध्यर्ष धाराव्ये शस्त्रे तथा, यथाक्रमं दीर्घ इस्त वक्ते भवतः। तभ उत्पत्ताव्यः दीर्घवक्तं, श्रध्यर्षधाराव्यः इस्तवक्तमित्वर्थः। उत्पत्ताव्यः दीर्घवक्तं, श्रध्यर्षधाराव्यः इस्तवक्तमितवर्थः। उत्पत्तपत्तव्यः गम्यते तन्त्रान्तरदर्भनात्। तस्य फलस्य उत्पत्तपत्तवाद्व्यत्त्वपतिमित सेश्चितम्। श्रितम्। श्रितम्। श्रितम्। श्रितम्। श्रितम्। श्रितम्। श्रितम्। श्रितम्। तस्य प्रवादः पत्ति। तस्य श्रष्टाद्वादाः उरिक्ष सङ्गुल विलारं।

Vägbhatartha Kaumudī, I. xxvi.

<sup>&</sup>lt;sup>1</sup> Ed. Med. Essays, vol. V, Part I, P. 445.

<sup>&</sup>lt;sup>3</sup> Hippocrates, I. 463.

De Anima, 26.

<sup>4</sup> Greeco-Roman Surgical Instruments, Pl. vii. fig. 1.

In the Asvavaidyaka, the utpalapatra and vrīhipatra knives are recommended to be used in puncturing the veins in phlebotomy<sup>1</sup>. "The surgeon who is practically acquainted with the methods of puncturing the veins, should use the utpalapatra and vrīhipatra knives for the purpose."

When used for puncturing the large veins the knife is recommended to be encircled with thread at a short distance from the end to prevent unnecessary injury to the vessels by plunging the the knife deeply <sup>2</sup>.

Hippocrates similarly "gaurds his phlebotome in the surgical treatment of empyema, by having it wound round with a rag, leaving the breadth of the thumb nail at the point."

Both the utpalapatra and vrihimukha knives are thus described in the Aśvavaidyaka<sup>4</sup>: The "vrihimukha knife should be six anguli long and half an anguli wide. The utpalapatra should also be similarly made."

The utpalapatra knife is recommended to be used for incising

Ibid, XV. v. 35.

Aśvavaidyaka, XIV. v. 21.

शस्त्रेणोत्पलपत्रेण बीहिपत्रेण वा भिष्ठम् ।
 श्चिपविधि सम्यग् स्थलम्बा प्रयोजयत् ॥
 Abvavaidyaka, XIV. v. 23.

स्तक्षण च संविध्य सुखं शस्त्रस्य बुद्धिमान्।
 यथाप्रमाणं संस्थाप्य ततो विद्यावयेत् शिराम्॥

<sup>3</sup> Hippocrates, II. 258 Kuhn's Ed. and 1. 88 Syd. Soc. Ed.

चड्डांङ्गुलन्तु विसीर्थे कूर्यच्छस्त्रं षड्ङ्गुलम् ।
 नामा त्रीष्टिमुखं मन्यक् तथा चीत्यलपवकम् ॥

the abdominal parietis of the horse; then a tube is to be pushed through the wound in the operation of paracentesis abdominis<sup>1</sup>.

The phlebotome used by the Greeks is nowhere described in their books; but from considerations of all the various operations to which the instrument was put bears out the fact of its being a sharp pointed, double-edged and straight lancet. The phlebotome of the Greeks might have then resembled in shape the utpalapatra of the Hindus. It was used by the Greeks for various operations besides phlebotomy, as for the opening of abscesses such as the parulis or gum boil<sup>2</sup>, puncture of cavities containing fluid as in opening the abdomen for ascites<sup>3</sup>, incising the tunica vaginalis as in excision of hydrocele sac<sup>4</sup> and for dissecting out warts<sup>5</sup> and sebaceous cysts<sup>6</sup>.

It is interesting to note that Pālakāpya, mentions utpalapatra and describes it to be eight anguli long, one and a half anguli broad and double edged. He uses it for puncturing vessels etc.

Aśvavaidyaka, LII. vs. 25, 26 and 27.

इदयसप्राधरे भागे ऊर्बभागे च नाभित:।
प्रधीवा नाभित: कुर्येच्छे दनं चतुरङ्गुले॥
यस्त्रेणोत्पुलपत्नेण वामभागे विचचण:।
एकभेवाङ्गुलं यस्त्रं कुचौचापि प्रवेशयित्॥
वैधन्नये ततस्त्रस्मिन् नालिकां वस्त्रविष्टिताम्।
प्रचिष्य गालयेदारि यावद्येकोष्टलाववम्॥

Paul, VI. xxvii.

<sup>&</sup>lt;sup>3</sup> Ibid, VI, L.

Tbid, VI. lxii.

<sup>&</sup>lt;sup>5</sup> Ibid, VI. lxxxviii.

Ibid, VI. xiv.

<sup>्</sup>रा बीहिनुखुपमा्यमुत्यलपतः भेदनायं ।

### 7. ARDDHADHARA.

It is difficult to ascertain the exact shape of this knife. Some translate it as a "single edged knife," but it really means, as Dallana explains, an instrument which has a sharp edge for half the length? It is also called cakradhāra. Vāgbhaṭa has a variant reading—adhyārddhadhāra—which means an instrument having a sharp edge for more than half the length3.

It is eight auguli long; the blade is two auguli long and one auguli wide, and the handle six auguli long. It is to be used for incision and division of parts of the body.

## 8. Sūcī or Needles.

Three needles are recommended to be used for applying sutures. They should be strongly made and rounded in shape. At one end they are flattened, grooved and pierced with an eye for the suture. The groove is said to have been intended to be the bed of the suture during stitching to prevent it from doing any harm to the tissue. In fleshy parts such as the thighs, a three ribbed needle, three anguli long, is advised to be used. For less fleshy parts and wounds about the joints, a similar straight needle but two anguli long should be employed, while for suturing the wounds of the stomach, intestines, scrotum and the vital parts of the body, preference is given to a needle curved like a bow, two and a half anguli long and having the pointed end

<sup>&</sup>lt;sup>1</sup> Hœrnle's Translations of Suéruta Samhitā, Bibl. Ind. I. viii.

<sup>&</sup>lt;sup>2</sup> पर्श्वधारिमिति, पार्ड धारा यसा तत् पर्श्वधारं, चक्रधारिमिति प्रसिद्धं तम्र प्रष्टाङ्गुलायतं चरिस पङ्गाल विलारं हाङ्गुलापलं। प्रन्ये तथ्यद्वधीरिमिति प्रतित, प्रधिकमदे धारायसा तत् प्रधादेभारम्। Nivandha Samgraha, I. viii,

See foot-note 5, P. 240.

shaped like a paddy. In thickness, these needles are described to be equal to the stalk of the flower of mālatī (Jasminum grandiflorum). They should have sharp fine points and good shape<sup>1</sup>. The needles are also recommended to be used for extraction of foreign bodies from the soft structures and also for evacuating abscesses<sup>2</sup>.

देशेऽल्पमांसे समी च स्ची इत्ताङ्ग्लह्य । भायता माङ्गुला चसा मांसले वापि पूजिता ॥ धनुर्व्वका हिता मर्चाफलकोषोदरोपरि । इत्येतास्त्रिविधाः स्चीसीच्यायाः सुसमाहिताः । कारयेन्यालतीप्रथवन्तायपरिमख्डलाः ॥

Suśruta Samhitā, I. xxv.

हत्तागृद्धं हदाः पाग्रे निखः स्चोऽत्र सीवने ॥ मांसलानां प्रदेशानां त्रासा चाङ्गुलमायता । भारतमांसास्य सन्धस्य ब्रयानां हाङ्गुलायता । ब्रीहिवक्ता धनुवैक्ता पक्तामाश्यमचीसु । सा साईहाङ्गुल सर्वा हत्तासायतुरङ्गुला ॥

Aşţānga Hrdaya Samhitā, I. xxvi.

तिस्रणां स्चीनां विषयविश्वेषे श्राकारभेदानाह मासलानामित्यादि 'मासलानां' कर्म्यानां शरीर प्रदेशानां सीवनायं स्ची, 'व्राक्षा' विकीणविश्विष्टा तथा चाङ्ग लमायता, श्राहुलचयदीर्घा कर्म्तव्या, श्राह्मास्त्रस्वल मग्रभागस्त्रेत्र न तु सर्म्यावयवस्य । स्व्याः सर्म्यान्याः हि साधारणतो कृता कारत्विनदृशादितिगस्यं । श्रस्याः श्रापः गृद् दृद पाश्रत्यं सामान्योक्ष्याः कथितमेव श्रल्यांसलस्थान संस्थितानां, सन्धास्थि संश्रितानांच व्रणानां सीवने द्राङ्गुलायता, श्रङ्गुलिह्य दीर्घा, स्चीकर्तव्या, पक्षायि, श्रामाश्ये तथा 'मर्यासुं' व्यादिषु संस्थितानां व्रणानां सीवने, व्रीहि वक्षा, पाटलादि व्रीहिव मुख्ता, 'धनुर्वक्रां' श्रमापि यमुर्वेदक्राकारा या स्ची सार्वदाङ्ग ला, भडीङ्गुलाधिक हाङ्गुल दीर्घा योज्येति योज्यं श्रमापि गृद् दृद् पाश्रत्वं योजनीयं । सार्बदाङ्गुलीत्यन्तेन च्छेदः । सर्वेत्यादि परेण सम्बध्यते ॥

Vägbhatärtha Kaumudī, I. xxvi.

Susruta Samhita, I. viii.

<sup>🏰</sup> स्वीक्रमप्ताटीसुखग्ररारीसुखानार्भुखिनकुत्रकानि विस्नावणे ।

In modern times, the surgeons use fully curved, half-curved and straight surgical needles. Waring¹ remarks: "The shape of the needle which ought to be used for closing an incision depends upon the depth and accessibility of the wound. In deep wounds, or wounds which are not readily accessible, curved needles will be found to be most useful, while for shallow cuts straight needles will be most convenient."

Susruta makes mention of a javamukhī needle<sup>2</sup> (lit. having the sharp end shaped like a barley corn) for passing a double ligature smeared with escharotic ointment, across the base of a tumour in opposite directions. Then by cutting through the nooses, and tying togeher the contiguous ends of the ligatures, the whole of the growth is encircled and strangled by them, exactly in the same way as in modern times a nævus is ligatured by means of a nævus needle. Cakradatta also quotes this description of the method of extirpating tumours by ligatures.

Erichsen says<sup>3</sup>: "When the tumour is small, an ordinary double ligature may be passed across its base, by means of a common suture needle; and the noose being cut and the thread tied on each side, strangulation will be effected. When it is of larger size, and of round shape, the most convenient method is that recommended by Liston. It consists in passing, by means

Suśruta Samhitā, IV. zvii. Cakradatta, Nādīvraņacikitsā.

<sup>&</sup>lt;sup>1</sup> Manual of Operative Surgery. By H. J. Waring, M.S., M.B., Third edition, P. 42.

शब्बुंदादिषु चीत् चिप्य सूखी सूतं निधापयेत्। स्चीभिर्यववक्ताभिराचितं वा समन्ततः। सृत्वी सृत्वेन विश्वीयाच्छित्रं चीपचरिद्वणम्॥

Erichsen's Surgery, Vol. II, P. 73.

of long nævus needles, fixed in wooden handles, and having their eyes near their points, double whipcord ligatures in opposite directions beneath the tumour; then cutting through the nooses, and tying together the contiguous ends of the ligatures until the whole of the growth is encircled and strangled by them."

There are many instances of the use of surgical needle by the Greek and Roman Surgeons. Needles of different sizes are recommended. Celsus mentions a large needle in describing the operation of suturing the abdominal parietis<sup>1</sup>, and another, evidently a small needle, which is said to have been used in the treatment of staphyloma of the cornea<sup>2</sup>. The needles were either round or three-cornered. "A few three-cornered needles of Roman origin have been found, although they are rare" (Milne<sup>3</sup>). Paul uses a needle in suture of the upper eyelid, and other modes of operating for trichiasis<sup>4</sup>, for the repair of wounds of the peritoneum<sup>5</sup>, and recommends a large sized needle containing a double thread to close the peritoneum in the operation for enterocele<sup>6</sup>.

Pālakāpya mentions sūcī or needles for stitching wounds.

They are eight anguli long, shaped like the tusk of an elephant and are either three ribbed, or four ribbed, or round, smooth and

<sup>&</sup>lt;sup>1</sup> Celsus, VIII, xvi.

<sup>1</sup> Ibid, VII, vii.

<sup>3</sup> Græco-Roman Surgical Instruments, P. 75.

<sup>\*</sup> Paulus Ægneita, VI. viii.

Ibid, VI. lii.

<sup>6</sup> Ibid, VI. lxv.

<sup>&</sup>lt;sup>7</sup> स्वी सेवनार्थे। घटाङ्गुलं मागदमाङ्गति। घासा चतुरस्ना वा दृदा समाहिता यया मलाना वने वसाविध्रसर्थम्।

strong. He reserves curved three-cornered needles for fleshy parts and round needles for skin, veins, nerves and arteries<sup>1</sup>.

Caraka recommends the use of leeches, knife and needles for extracting blood from the piles<sup>2</sup>. He also advises us to use needles for pricking the patches of leprous spots<sup>3</sup> before the application of leeches for extracting blood.

### 9. Kuśapatra.

It is a form of knife resembling in shape the leaf of a kuśa grass (Poa cynosuroides)<sup>4</sup>. The instrument should be six anguli long (Suśruta); the blade measuring two anguli (Vāgbhaṭa)<sup>5</sup>

या:स्चिस्त्रिविधाः प्रोक्ताः सस्त्राध्ययि संस्थिताः। नागदन्ताक्तिविधाः तिकोणा चिति निचयात्॥ ष्रस्थायितं नागदन्तया मांसजं च विकोणया। त्वकस्तायु धमनीस्यं च शिराजं चैव वत्तया। षाहार्थ्य सर्व्ययनाणां स्चा सीवनिमिष्यते॥

Pālakāpya, III. i

जलीकोभिः तथा यस्त्रेः स्चीभिर्वा पुनः पुनः।
 भवर्भमानं क्षिरं रक्तार्थीस्यः प्रवाहयेत्॥

Caraka Samhitā, VI. ix.

॰ प्रस्कृतमल्पं सुष्ठं विरेचयेदा जलीकाभिः।

Ibid, VI. vii.

कुश्रपत्रमिति, कुश्रपनतुष्यं कुश्रपतं तत्मानमाहः -- पङ्गुलैक्चकं विद्यादङ्गुलं फलसुच्यते ।
 इन्तं सम्रात् वाङ्गुलं मध्ये कुश्रपचसम लच्चणम् ॥

Nivandha Samgraha, I. viii.

• कुशाटी वदने यान्ये बाङ्गुलंसात्तयोः पात्त ॥ Aşṭāṅga Hṛdaya Samhitā, I. xxvi.

कुमाटीवदने हे शस्त्रे, बाब्ये विद्यावण विषये योज्ये। तयो: कुशाटी वदनयो: पर्वा इ.ह.जं, पहुलाइयं परिमितं सात्। Vāgbhatārtha Kaumudī, I. xxvi. and the handle four anguli, but according to Bhoja, the handle is three anguli long. It is to be used for draining pus from abscess. The handle has a ring like ornamentation, about one anguli in diameter. Another variant reading describes the blade, the ring, and the handle to have the lengths of two, three, and two anguli respectively. This would make the total length of the instrument to be seven anguli; so evidently there is some lapsus calami in the second reading.

Cakradatta uses kuśapatra as a bleeding lancet and says¹:

"Out of the twelve vessels that lie on the sides and underneath the tongue, select the two large bluish vessels on either sides of the tongue, raise them up by vadiśa or hook and puncture them by the kuśapatra knife and then, after bleeding, apply a paste of treacle and ginger to the wound". In the Yogaratnākara², the author advises us to adopt this method of bleeding, in the treatment of tumours in the neck.

"Pālakāpya mentions kuśapatra and describes it as being shaped like a kuśa grass. It is nine anguli long—the handle being

Cakradatta, Galaganda Cikitsa.

Yogaratnākara, P. 321.

¹ जिह्नाया: पार्श्वतोऽधस्तां शिरा द्वादश कीति ता:।

तासां स्थूलिंधिरे क्वाची विध्यात् ते तु सने: सनै:॥
 बिङ्गियोव संग्रह्मा क्वाप्यतिच बुिड्मान्॥

श्रीतिकाधः पार्श्वयोर्न्साच्छिरा द्वादय कौर्तिताः। तासां स्थूलि सिरे दे च च्छिन्दाते च यनैः यनैः। विक्रियेव संग्टका क्ष्रापतिण द्वाद्विमान्। स्रुते रक्ते क्रये तिसन् द्वातस गुड्माद्रकम्॥

<sup>े</sup> नवाङ्कुलं क्षप्रपत्नं। पञ्चाङ्कुलं डत्तं। चतुरङ्कुलम् पत्नं। अध्यार्थाङ्कुलिकृत-सुभवतो धारं। कुष्रपत्राक्षति गन्भीरपाकभेदनार्थं षङ्कुलं डत्तम् अध्यार्धाङ्कुलं प्रतं। Pālakāpya, III. xxx.

five or six anguli and the blade four anguli long. The blade is one and a half anguli wide and is sharp-edged on both sides (i.e., double-edged). It is used for incising deep abscesses.

# 10. Атімикна.

This instrument is described to have the shape like the beak of the jalavardhanī bird or āṭī¹ (Turdus ginginiamus),—a bird living in the marshes. It is six auguli long; the blade measuring two and the handle four auguli. So it is of the same size as the kuśapatra to which it also resembles in function. Bhoja is of opinion that its blade is one and the handle seven auguli long.

## 11. ŚARĀRĪMUKHA.

This instrument is a pair of scissors resembling the face of the long beaked bird called śarārī. Dallana describes two varieties of the bird, one with white shoulders, and the other with a red head. It is the former kind which is referred to here<sup>2</sup>. Suśruta describes its length to be ten anguli<sup>3</sup>, while Dallana mentions the length to be twelve anguli.

डन्तं सप्ताङ्गुलं विद्यात् तस्त्राये फलिमध्यते । भाटीसुख प्रकारं हि फलमङ्गुष्ठमायतम् ।

Nivandha Samgraha, I. viii.

श्वारीमुखिमिति, दीघेचञ्च: पिचिविशेष: स दिविध: धवलकान्ध: रक्तशौषेश धवलकान्धमः श्वारीत संज्ञा तन्मुखवन्मुखं तसा श्रद्धमा लोके कत्ते रीति संज्ञा ताख दादशाङ्गुलां चलत्यलासां कुर्य्यात्।
Ibid.

¹श्वाटीसुखिमिति, श्वाटी जलवर्षनी नाम पिचिविशेष: तरसुखवन्मुख यस्र तत् श्वाटीसुख तथाचीतः :—

३ दशाङ्खा शरारीमुखी सा कत्तरीति कथति। Susrata Samhitā, I. viii.

It is recommended to be used for evacuating abscess<sup>1</sup>, etc. Suśruta mentions karttarī as a synonym but Vāgbhaṭa counts it as a separate instrument. He describes karttarī as a pair of scissors used by the barbers for clipping hair and is said to have been necessary for dividing the nerves, ligaments and fine hairs<sup>2</sup>.

#### 12. Antarmukha.

Susruta describes another variety of scissors, used principally for evacuating abscesses. It is so named, for its straight cutting edges are within its curved claws<sup>3</sup>. It is said to be six anguli long and one and a half anguli broad<sup>4</sup>. It seems that the curvature of the blade varied widely; and Vāgbhaṭa describes a variety called

Astānga Hrdaya Samhitā, I. xxvi.

स्नावे विस्नावनविषये नर्साणि शरार्थ्यास्य विकूर्धने हे शस्त्रे योज्यः। तत्र शरार्थ्यास्य शरारीमुखं शरारी दीर्घचचुः पचिविशेषः तसा मुखवदास्यं यसा तत् शरार्थ्यासा, तच चलत् फलं दशाङ्गुलं दीर्घे कार्यः।

Vägbhatartha Kaumūdī, I. xxvi.

<sup>3</sup> स्नायु सूच्य कचच्छे दे कर्त्तरी कर्त्तरीनिभा।

Aştanga Hrdaya Samhita, I. xxvi.

कर्त्तरी श्रस्त्रमाष्ट साधिव्यादि कर्त्तरी नामगस्त्रं कर्त्तरी सहश्रं तच सायुच्छे दने म् स्त्रकेश-च्छेदने च योज्यं। कर्त्तरी काटारी इति यस प्रसिद्धिः।

Vägbhatärtha Kaumüdī, I. xxvi.

अन्तर्भुखिमिति मध्यमुखं तल्लचणमाष्ट्र— भ्रष्टाङ्गुलप्रमाणेन जिल्लाचारेण चाप्तुतम्। ग्रस्त्रमन्तर्भुखं नाम चन्द्रार्श्वे दव चोहतं।

Nivandha Samgraha, I. viii.

🕈 तददन्तर्भुखं तस्य फलमध्यर्षमङ्गुलं ॥

Aşţānga Hrdaya Samhitā, I. xxvi.

<sup>·</sup> वाव्ये शरार्थास्त्रविक्षिके।

arddhacandrānan¹ or "half-moon faced" scissors in which the blades are curved like the half-moon. It has the length of eight anguli, the blade measuring one and a half anguli. This is also to be used for letting out pus from abscesses.

Hārīta, however, mentions a śastra, called also arddhacandra or half-moon, but he recommends its use for excising the prolapsed arms of a dead fœtus to effect its delivery<sup>2</sup>. This instrument can not but be a knife, for it seems difficult to cut off the arm, even of a fœtus, with a pair of scissors. Moreover, antarmukha has never been credited with the power of excising the arm.

#### 13. TRIKŪRCCAKA.

It has been translated in English as a thin-edged sharp instrument or trocar. Wise, Dutt and Hoernle agree to mean by it a trocar. But it can be better explained if we understand by the term an instrument consisting of three needles fixed on a round

भपरच विद्यावण शस्त्रभाष्ठ तहित्यादि तहत् कुशाटीवदनवत्, श्रन्तमुंखं भन्तमुंखं नाम शस्त्रं सार्थे यीज्यं तस्य भन्तमुंखस्यपालं अध्यर्डमङ्गुलं स्थात्। आधि अधिकं भर्दे अध्यद्धं। सार्डेकमङ्गलमित्यर्थः।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

# <sup>1</sup> अर्ड चन्द्राननं चैत तथाध्यद्वाङ्गुर्लं फली ॥

Aşṭāṅga Hṛdaya Samhitā, I. xxvi.

यन्तर्भुखस प्रकारभेदमाह धर्षचन्द्राननित्यादि एतत् यन्तर्भुखं, पर्षचन्द्राननं धर्ष-चन्द्राकारमुखस्य भवति, तदिप तहत्, कुशाटीवदनवत् सात्ये योज्यं। तस्र फली यर्डाङ्गुलं यर्डाङ्गुलपरिमाण फलिनत्यर्थः। यर्षचन्द्राकारमुखलात् अस्य यस्त्रस्यापि यर्षचन्द्राननिर्मित् संज्ञीति वीध्यं।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

<sup>2</sup> श्रयवार्डचन्द्रेण गस्त्रेणैव स्तगर्भस्य वाहुयुगलं सञ्जिय वाह्ननि:सारयेत्। Hārīta Samhitā, III, li. wooden handle<sup>1</sup>. According to Suśruta, the length of the instrument is six anguli. But others describe it as eight anguli long, the blade and the handle measuring three and five anguli respectively<sup>2</sup>. The distance between the edges is the breadth of a grain of rice. The end of the handle is ornamented with a circular metallic plate as a ring.

It is recommended to be used for evacuating abscesses and for draining blood from the nasal polypus.

Caraka<sup>3</sup> mentions an instrument called kūrcca and says:—
"After fomenting and thus softening the rounded nodules (of leprosy) which are fixed and hard, by heated stones and fumigations through tubes, they are to be injured by the kūrcca and the blood that oozes out, should be wiped away."

Two other instruments are described by Vagbhata as being constructed on a similar principle. One is named kurca and the

- ¹ चिक्क ईकिमिति तय: कुर्ची यस्त्र तत् तिकूर्चकम्। कुर्च: कुर्ची इति लोके। Vāgbhaṭārtha Kaumūdī, I. xxvi.
- <sup>2</sup> विकूर्वकिमिति चय: कूर्ची यस्य तत् विकूर्चकम् तच तन्नान्तरम् :—

भङ्गुलानि तथाष्टी च शस्त्र' कार्य्यं विकूर्यकः।
फलेरन्तमृंखाकारेवङ्गुलेरन्तितं विभि:।
एकेकस्य फलस्वैषामन्तरं ब्रीहिसस्मितम्।
हन्तं पञ्चाङ्गुलायामं कार्य्यं क्चकमृष्टितम्॥

Nivandha Samgraha, I. viii.

अस्थिरकठिनमण्डलानां स्वित्रानां प्रस्तरप्रणाङ्गीभः। क्रुचैं विधितानां रक्तात्क्षेणोऽपनेतव्यः॥

Caraka Samhitā, VI. vii.

other, khaja. The kūrcca¹, he describes as an instrument "consisting of seven or eight rounded sharp needles, four anguli long, nicely bound together by a cord and tightly fixed on a circular wooden handle." He mentions its use in the operation of scratching to cure baldness and the brown and black spots on the face. For scarifying a bald spot, Cakradatta² uses needles, rough leaves, etc. "The khaja³," Vāgbhaṭa continues, "consists of eight rounded needles having the sharp ends half an anguli long. It is to be introduced

भ तूर्वीवर्त्ते का पीठस्था: सप्ताष्टी वा सुवन्धना:। संयोज्य नीलिका व्यङ्ग केश शातिषु कुट्टने॥

Aşţāṅga Hṛdaya Samhitā, I. xxvi.

सम्प्रति कूर्बांख्यं शस्त्रं लचियतुमाह सर्बेत्यादि ता: स्चः सर्वेपव बत्ता: वर्तुला: तथा चतुरङ्गुला: चतुरङ्गुलदीर्घा: कृष्वः इत्युच्यत्ते । ताः स्चः पुनः कीष्ट्याः १ बत्तेकपीठेस्थाः बत्ते वर्तुले एकिष्मन् पृष्टे संस्थिताः, एकं बत्ताकार काष्ठफलकं परिवेध्य स्थिता इत्यर्थः । तथा सप्तसंस्थिका घष्टसंस्थिता वा, तथा शोभनं रच्चादिकतं वन्यनं यासां तास्तयाविधाः सुवन्यनाः । स कृष्यः नीलिकादिषु रोगेषु कुट्टने कुट्टनार्थे संयोज्यः प्रयोज्य इत्यर्थः । कुट्टनं भाँच्डान इति लोके । नीलिकादयो वत्यमाणा केश्यातः केशानां पतनं ।

Vāgbhatārtha Kaumūdī, I. xxvi.

<sup>2</sup> अवगाढ़पदश्चैव पुच्छियत्वा पुन: पुन:।

Cakradatta, Kşudraroga Cikitsā.

त्रवगादपदिमिति गमीरपदं यथास्यात् तथा:मूचीनखरञ्जन्यादिभि: पुच्छियिला \* \* \*

Tattva Candrikā, ibid.

अर्बाङ्गुलेमुंखें व तेरष्टाभि: कर्यके: खज:। पालिन्यां मध्यमाणेन प्राणात्तेन इरेट्स्क्॥

Aştānga Hrdaya Samhitā, I. xxvi.

खजसंज्ञतमस्त्रमाह भर्जाङ्गलसुखैरित्यादि भर्जाङ्गलप्रमाणं सुख येषां ते भर्जाङ्गलसुखा सैवर्जाङ्गलसुखै: वते: वर्तुलै: भर्टाभ: भर्टसंख्यते: तर्गरके: क्रतं प्रस्तं खज उच्यते। तेन खजाख्येन प्रस्त्रेन पाणिभ्यां हसाभ्यां मध्यमाणेन भालोद्यमाणेन प्राणात् नासिकायां अष्टक्रते हरेत्, निर्हरेदित्यर्थ:।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

into the nostrils and turned to and fro with both hands to bleed the nasal polypi."

The Greeks and Romans used a similar instrument for identical purpose. It was called katiádion, measuring a blade of grass, and was used for opening abscesses of the womb and tonsils, drawing blood from the inside of the nose and perforating the feetal cranium.

In India, the practice of drawing blood from the nasal polypus by blades of grass is still in vogue; and Aræteus mentions it as a common mode of scarification in ancient Greece also1. "On the next day we are to abstract blood from the inside of the nostrils, and for this purpose push into them the long instrument named Katiadion, or the one named Toryne, or in want of these we must take the thick quill of a goose, and having scraped the nervous part of it into teeth like a saw, we are to push it down the nostrils as far as the ethmoid cells, then shake it with both hands, so that the part may be scarified by its teeth. Thus we shall have a ready and copious flow of blood; for slender veins terminate there and the parts are soft and easily cut. The common people have many modes of scarification, by rougher herbs and dried leaves of the bay, which they introduce with the fingers and move strongly." Paul<sup>2</sup> opens the vessels in the nostrils with the reed called typha.

# Kuţhārikā.

It is a small instrument shaped like an axe, so called from its resemblance to kuthāra, an axe which is still used in India

<sup>&</sup>lt;sup>1</sup> Extant works of Aræteus, P. 460.

<sup>&</sup>lt;sup>2</sup> Paul, vol. II. Sec. lx.

for cutting wood<sup>1</sup>. Vāgbhaṭa says<sup>2</sup> that "the base of the blade is thicker and broader than the end and is fitted to a handle, seven and a half anguli long. The blade which is shaped like the tooth of a cow, has the width of one anguli." Bhoja describes the width of the blade to be a half anguli<sup>3</sup>. It is recommended to be used for puncturing vessels in the following manner<sup>4</sup>:—"Hold the handle with the left hand and put the blade on the vessel resting on a bone. Raise the instrument a little upwards and then strike over the thick base of the blade with the downward strokes of the middle or index finger, when let go

Aştānga Hrdaya Samhitā, I. xxvi.

कुठारिका संज्ञकं अस्त्रमाष्ट्र पृथुरित्यादि कुठारी पृथुः स्यात्। क्रिटारिका नामअस्त्रं पृथुः स्यूलम् स्यादित्यर्थः। तथा गीदन्तसहमार्श्वाङ्गलानना गवां दन्तः गोदन्त सत्तरहमं तुल्ह्याक्तरं भर्जाङ्गलायतं भाननं मुखं यस्याः सा तथा विध्या तया कुठार्था कर्षदर्ख्या भर्यूां उपरिस्थितां सिरां विश्वेत्। तङ्खं वामइस्तेनीचीकत्य कुठार्थामुखं थिरोपरि संस्थाप्य दिचनाङ्गष्टतस्त्रभेनीभ्यां कुठारिकामस्त्रक्रमभिक्त्य सिरां विश्वेत्।

Vāgbhatārtha Kanmūdī, L xxvi.

- कुठारिकति कुठारतुल्या कुठारिकाः— कुठारिकाया इन्तं स्थात् साई सप्ताङ्गु लायतं । फलमङ्गीङ्गु लायानं गीदन्तसद्दशं समम्॥
  - Nivandha Samgraha, I. viii.
- तथा मध्यमयाङ्गुल्या वैद्योऽङ्गुष्ठ विसुक्तया। ताङ्येटुत्यितां जात्वा स्पर्यादवाङ्गुष्ठ पीड्नै: ॥ कुठाव्यां लच्चयेन्यध्ये वामङ्क्ष ग्टङ्गीतया। फलोड्गे से सुनिष्कम्पं शिरां तद्वच सोच्येत्॥

Aşţānga Hrdaya Samhitā, I. xxvii.

<sup>&</sup>lt;sup>1</sup> For figure of Kuthāra as used in Ancient India, see Pl. xxii in Ferguson's Tree and Serpent Worship.

पृथु: कुठारी गोदन्तसहमार्ज्ञाङ्गुलानना। तयोर्ज्जदण्डया विध्येदपर्यस्थां सिरां स्थितां॥

forcibly from the under surface of the thumb". Cakradatta¹ also advises us to use it in a similar manner. To open the veins in fleshy parts, Vāgbhaṭa recommends the vrīhimukha knife, while the kuṭhārīkā is advised to be used in venesection on bony structures.²

Pālakāpya<sup>3</sup> mentions the kuthāra and describes its shape to be like an axe. It is to be used for excision and scarification. He describes another sastra called vatsadanta (*lit.*, the calf's tooth); it is ten anguli long; and the mouth of the instrument is one and a half anguli broad. It is also to be used for excision.

"Bleeding from the jugular vein, he (Albucasis) describes much in the same way that it is now practised by veterinary surgeons, namely, by placing a sort of scalpel bent at the point, which he calls fissorium, upon the vein, and striking the instrument with a hammer or some such body. He gives drawings of variously shaped lancets for opening the veins of the arm."

"Ferriers bleed with a fleam, which, though apparently a clumsy method of operating, is certainly safer than the lancet in

Cakradatta Śīrāvyādhādhikāra.

मांसले निचिपेद्देशे त्रीहासंग्र त्रीहिमातकम् ।
 यवार्डमस्यासुपरि शिरां विध्वन् कुठारिकाम् ॥

Aştānga Hrdaya Samhitā, I. xxvii.

कुठाराक्ति कुर्यात्। कुठारी शस्त्रमच्छेदनायं। वस्तदन्ताकृति वस्तदन्तं दशाङ्गुलम्। एकेकमध्यक्षंङ्गलसुखम्। एवमेतानि च वौखिप यथायोगं प्रच्छन्नायं।

> कुठाराक्रतिशस्त्रेण ततसां प्रच्छयिक्रियक्। नातिगाढ़ंन चलघुंन घनं विरलंन च॥

> > Pālakāpya, III. iii.

वामहस्तेन विन्यसा कुठारीमितरेण तु। ताड्येन्सध्यमाङ्ख्याङ्क्ष्यस्यम् त्राया॥

<sup>\*</sup> Albucasis Chirrug. ii. 97; also see Adam's Commentary on Paul, VI. lx. 323,

unknown hands." "In bleeding with a fleam, the near side is most convenient. In skilful hands, there is no occasion for a blood stick, as the fleam may be struck with the right hand if it is made broad and round at the back. It also may be made much smaller and neater than that generally employed". There is a drawing of such an improved fleam which much resembles in appearance the kuthārī of the Hindus. "A fleam is rather more convenient instrument in bleeding, either from the arm or thigh, as the vein is somewhat apt to roll when a lancet is used."

#### 15. VRĪHIMUKHA.

It is described as a kind of trocar<sup>2</sup>, the sharp end being pointed and shaped like a grain of paddy. It is six anguli long, the handle being two and the blade four anguli (Bhoja). But Vāgbhaṭa<sup>3</sup> describes the length of the blade to be one and a half anguli.

It is advised to be used for paracentesis abdominis in abdominal dropsy. Susruta says: 4 "The friends of the patient should

White's Compendium of the Veterinary Art, 1851, 18th ed. P. 342.

वीहिमुखिमिति वीहिमुखिमित मुखमस्य वीहिमुखं तच भोजः— शस्त्रं वीहिमुखं कार्यमङ्जानि षडायतम्। हाङ्गुलं तस्य वन्तं सात् तत्पालं चतुरङ्गुलम्। तग्मुखं बीहिविसारं तनुसंगृदकायटकम्॥

Nivandha Samgraha, I. viii. \* \* तथाध्यक्षीङ्गुलं फली।

गीहिवज्ञ 🔭 🦈 Aṣṭāṅga Hṛday Samhitā, I. xxvi,

उदकोदिरणस्तु वातहरतैलाभ्यक्तस्रोणोदकस्तित्रस्य स्थितस्राप्तै: सुपरिग्रहीतस्याकचात् परिविष्टितस्याची नाभेर्व्वामतयतुरङ्गुलमपहाय रोमराज्या ब्रीहिमुखेनाङ्ग्रष्टोदर प्रमाणमवगादं
 विध्येत्॥
 Sustratā Samhitā., IV. xiv.

hold him under the axilla. Then the abdomen is to be tapped by the vrīhimukha knife at a point, four anguli distant on the left side from the median line, underneath the navel." Vāgbhaṭa¹ advises us to surround a broad bandage round the abdomen before tapping it by the instrument, which he recommends to be introduced up to one anguli. Cakradatta² refers to works on surgery for the surgical treatment of ascites. A small incision is directed to be made before the puncture.

In the Aśvavaidyaka, for this operation, the utpalapatra knife is recommended; an incision four anguli long is directed to be made above or below the navel of the horse, and then the end of the knife is to be plunged into the abdominal cavity up to one anguli.<sup>3</sup> The vrīhimukha is also advised to be similarly used.<sup>4</sup>

Hippocrates speaks of evacuating the fluid in paracentesis abdominis with an instrument which Camper thinks must have been a kind of trocar.<sup>5</sup>

सजले जठरे तैलैरभ्यत्तस्यानिलापहै:।
स्वित्रस्यात्यान्द्रना कचमुदरे परिवेष्टिते॥
वहिद्दितिस्याने विष्ये दङ्गुलमाचकम् ।
निधाय तिस्वत्राड़ीच सावयेर्डमस्यसः॥
प्रथास्य नाड़ीमाक्तष्य तैलीन लवयोन च।
ब्रयमभ्यक्य वहा च वेष्टयेद वाससीदरम्॥

Aşṭāṅga Hṛdaya Saṁhitā, IV. xv.

<sup>3</sup> जातं जातं जलं सार्वं शास्त्रीत्तं शस्त्रकर्माच।

Cakradatta, Udaracikitsā.

1.

<sup>&</sup>lt;sup>3</sup> See foot-note, 1. p. 242.

See foot-note. 4. p. 241.

<sup>&</sup>lt;sup>5</sup> See the Commentary on Paul. By Adams, vol. II, P. 338,

It is also to be used for puncturing the vessels in phlebotomy (Vāgbhaṭa)¹ especially in the fleshy parts of the body.² Cakradatta uses vrīhimukha in phlebotomy and says: "The sharp end of the vrīhimukha should be kept under the palm between the thumb and index finger and is to be thrust into the seat of puncture."

Susruta directs us to use it in tapping the hydrocele: 4 "Then the hydrocele is to be wrapped round with a bandage. The fluid is next to be drained by tapping it with a vrīhimukha on the lower part of the scrotum, little externally to the suture." Similar directions are given in the Yogratnākara. 5 Cakradatta also gives a similar discription. 6

Aştānga Hrdaya Samhitā. I. xxvi.

त्रीहिसुखाखां शस्त्रं चाह त्रीहिनक्रमित्यादि त्रीहर्वक्रमिन वक्रं यस्त्र तत् त्रीहिनक्रां। त्रीहिसुखं यत्शस्त्रं तत्सिरानां व्यघे व्यधने तथा उदरसा जलोदरसा व्यघे सानणार्थं योज्यं।

Vāgbhatārtha Kaumudī. IV. xxvi.

ताड्यन् पीड्येचैनां विध्ये द ब्रीहिमुखेन तु। Aşṭāṅga, Hrdaya Samhitā, I. xxvii.

<sup>2</sup> मांसले नि:चिपेट्टेशे ब्रीहासं ब्रीहिमाचकम्।

Tbid.

मांसलिष्यवकाशिषु यवमाचं शस्त्रं निद्ध्यादतोष्ट्रन्थेष्यद्वयवमातं ब्रीहिमातं वा ब्रीहिमुखेन । Susrutā Samhita, IV. viii.

- ततो ब्रीहिसुखं व्यध्यप्रदेशे न्यस्य पौड़येत्। \* चङ्गहुष्ठतक्वनीयस्तु तलप्रच्छादितं भिषक्।।
  - Cakradatta Šīrāvyādhādhikāra.
- See foot note 5. P. 123.
- संस्वेद्य मूत्रप्रभवं वस्त्रखख्डेन वेष्टयेत् ।
   सीवन्या पार्श्वतीऽचस्ताविध्येत् व्रीहिसुखेण वे ॥

Yogaratnākara.

संस्वेद्य स्वप्रभवां वस्त्रपट्टेन वेष्टयेत्।
 सीवन्याः पार्श्वतोऽघस्तादिध्यादौहिसुखेण वै॥

Chakradatta Vīddhi Cikitsā.

<sup>&</sup>lt;sup>1</sup> ब्रीहिवक्कं प्रयोज्यच तत्सिरोदरयोवेंध्ये:।

Paul describes the operation but he recommends a sharppointed knife or lancet instead of a trocar. He says: "Wherefore we must make the patient stand erect; or if this can not be done, we must cause him to be seated; \* \* \* . We give orders to the assistants standing behind to press with their hands and push downwards the swelling to the pubes. taking a sharp-pointed knife or lancet, if dropsy be among the intestines, in the perpendicular line of the navel, and about three fingers' breadth distance from it we divide the hypogastrium as far as the peritoneum."1 Celsus mentions that some perform it at a spot four fingers' breadth below the navel in the left side, and recommends us to use a perforator, the point of which should be about the size of the third part of a . fingers' breadth.2 Vegetius, the veterinary surgeon, recommends paracentesis for the dropsy of cattle.3 The Arabic authors Avicenna,4 Serapion,<sup>5</sup> Albucasis,<sup>6</sup> Haly Abbas,<sup>7</sup> and Phases,8 give similar descriptions.

In modern times, we perform the operation in the same way. "It is necessary in certain conditions to tap the abdomen in order to withdraw fluid which has accumulated there and this is usually done by means of a special trocar and canula. The site for tapping is selected, the usual spot being in the middle line, half-way between the umbilicus and the pubes.

Paulus Ægineta, Bk. VI. I. Syd. Soc. Ed.

<sup>\*</sup> Celsus, vii. 15; ii. 10.

<sup>\*</sup> Vegetius. Mulom. iii. 25.

<sup>\*</sup> Avicenna, iii. 14; iv. 13.

<sup>\*</sup> Serapion. iv. 7.

Albucais: Chirrug. ii. 54.

<sup>&#</sup>x27; Haly Abbas, Pract. ix. 41.

<sup>\*</sup> Rhases, Cont. xix.

small puncture about one-third of an inch long is made with the knife at the spot selected. The trocar and canula to which the rubber tubing is attached, are then thrust through the abdominal wall into the peritoneal cavity."

The Greeks did not describe the operation of tapping the hydrocele. They always preferred the open incision to puncture. Paul uses a knife for making the skin incision, but when the tunica vaginalis is laid bare, he divides it through the middle with a lancet for bleeding.<sup>2</sup> Some of the Arab authors mention the operation of puncturing the scrotum for hydrocele. If the patient be timid, and do not choose to submit to open incisions, Albucasis advises the surgeon to let out the water either with a scalpel or the instrument used for tapping in dropsy. He states, however, that the water will collect again after this operation.<sup>3</sup> Rhases also describes this operation.<sup>4</sup>

In modern times, trapping for hydrocele is still practised. "When trapping a hydrocele the patient should be sitting up in a chair \* \* \* . The scrotum, having been cleansed, is grasped from behind by the left hand \* \* \* . A spot, free from any large veins, is selected on the anterior and lower part of the swelling, and the trocar and canula introduced with sharp stabbing movement."

Pālakāpya<sup>6</sup> describes vrīhimukha as \*shaped like a grain of paddy and recommends it for scission and excision of munja.

<sup>&</sup>lt;sup>1</sup> Operations of General Practice. By Corner and Pinches. P. 109, 2nd ed.

<sup>\*</sup> Paulus Ægineta, VI. lxii.

<sup>&</sup>lt;sup>3</sup> Albucasis. Chrug. ii, 62.

<sup>1</sup> Rhases. Cont. xxiv.

<sup>&</sup>lt;sup>5</sup> Operations of General Practice, P. 145.

सवषं पाटनं चैव क्याद्रीहिमुखेण तु ।

# 16. ĀRĀ OR AWL.

It is a long sharp needle in handle, so called from its resemblance to the shoe-maker's instrument known as awl. "It has a total length of sixteen anguli, with a sharp end of the size of a sesamum seed. The handle is tapering like a cow's tail and is equal in circumference to the young stem of Dūrvā (Unodon Dactylon)" (Bhoja)¹. Suśruta mentions its length to be six aiguli. Vāgbhata describes the length to be one aiguli, the basal half being round, and the terminal half, four cornered and sharp pointed. The terminal part is introduced into the inflammatory swellings to confirm the diagonosis of suppuration. It is also to be used to drain the congested blood vessels in the matrix of the nails as a result of traumatism².

- भारिति, आरिव आरा असि: चर्म्यकाराणा शस्त्रं। तत्र तन्त्रान्तरम्:— आरा द्वाष्टाङ्गुलयामा कर्त्तत्या तु विशाम्पते। तिलप्रमाणन्तु फलं तस्त्रा: कार्य्यं समाहितं। दुव्याङ्ग्रपरीणाष्टं बन्तं गोपुच्छसिन्नभं।
  - Nivandha Samgraha, I. viii.
- व्यधने कर्णपालीनां यृथिका सुकुलानना। भाराडाङ्ग ल बत्तास्ता तत्प्रवेशो तथोर्ज्वतः॥ चतुरस्रा तथा विध्येच्छोयं पक्काम संश्ये। कर्णपालीच वस्त्तां वस्त्ताया न च शस्त्रते॥ स्ता विभागग्रिकता व्यङ्गला कर्णवेधनी।

Aştānga Hrdya Samhitā. I. xxvi.

सम्प्रति कर्णपालि व्यथन योग्यानि शस्त्राणि वक्तुमाइ व्यथने इत्यादि कर्णपालीनीं कर्णवतानां व्यथने व्यथनविषये यूथिका यूथिका नाम शस्त्रं योज्यं। कीटगी ? सुकुलानना सुकुलवत् प्रकृतलात् यूथिका मुकुलवत् ज्ञाननं सुखं यस्याः सा तथाविषा। ज्ञारित्यादि वर्षाङ्गुलं परिमानं इत्तं वर्त्तुलं जास्यं सुखं यस्याः सा तथा जर्ज्वाङ्गुलहत्तास्या, तथा स एवं पर्वोङ्गुलं परिमानं इत्तं वर्त्तुलं पास्याः सा तथा वर्षाः सा तथा जर्ज्वाः तथा स्वयः प्रवेशः प्रवेशः परिमाणं वर्षाः सा तथाविषा तत् प्रवेशा तथा जर्ज्वः इत्तार्बाङ्गुलादुपरिष्टात् तथा पर्वोङ्गुल परिमाणं व चतुरस्ता चतुष्कीणा सा जारा कथते।

It is also said to have been used for perforating a thick lobule of the ear, though for this purpose another instrument called karna-vedhanī or ear-perforator—a needle specially meant for perforating the lobules of the ears,—is mentoined. It is three anguli long, having a slit or eye in the three-fourths of its length. The barbers used a similar needle to perforate the ears on the ceremony of tonsure.

For piercing the lobule of the ear, another instrument is mentioned. It is called jūthikā, from its end resembling in shape the conical bud of jūthikā flower (Jasminum Auriculatum).

Susruta uses ārā or pāṇimantha to perforate the bone in diseases of the medullary canal caused by the obstructed and deranged air<sup>1</sup>. He next introduces one end of a tube open at.

एतेन भाराया: फलं एकाङ्गुलपरिमितिमिति फलित तत प्रथमार्डाङ्गुलं इत्तंमपरार्डाङ्गुलं चतुरसं तयोक्तमयमागर्योर्मध्ये भग्धस्यतुरस्ने भागः प्रवेग्ययोग्य इति सूचितं। तया भारया पक्षाम संग्रये भयं ग्रोधः पक्ष भागोविति संग्रये सित ताह्यं ग्रोधं विधेन्न, तथा वहलां भितासलां कर्णपालीश्व तया विधेनिति योज्यं। वहलामित्यन्तेन च्छेदः। वहलाया-मित्यादि वहलायाः भित्मांसलायाः कर्णपाल्याः व्यधने कर्णविधनी नासी स्वी च ग्रस्ति। क्षीह्यी ? चिभागग्रविरा, विभागः ग्रविरं ग्रन्यं यस्याः सा तथाविधा विभागग्रविरा तथा व्यङ्गला भङ्गुलवयदीर्घा। न वेवलमारा वहलायाः कर्णपाल्या व्यधने ग्रस्ति पितु कर्णविधनी नासी स्वी च ग्रस्ति इत्यर्थः। कर्णविधनी स्वी चक्षदिशीया नरसुन्दरा कर्णविधनार्थं व्यवहरित। भतीऽपं वाहुल्यवर्णयीति।

Vāgbhatārtha Kaumūdī. I. xxvi.

निक् चेऽस्थिन वा वायी पाणिमस्थेन दारिते। नाड़ीं दलास्थिन भिषक् चुषयेत् पवनवली।।

Suśruta Samhitā. IV. iv.

निरुद्धे इत्यादि । लङ्मांसं शस्त्रेण विपान्य षर्स्य पाणिमयेन प्रराशस्त्रेण विद्वा तत्र रखे हिसुस्त्रीं नाड़ीं प्रणिधाय सुखमारतं चूषणेन लवनापकर्षणं करणीयमिति ।

Niyandha Samgraha. IV, iv,

both ends into the canal through the hole in the bone, while through the other end the surgeon sucks out the air by his mouth.

For perforating the ears of the elephants, a similar needle is recommended by Pālakāpya. It is known as karmāra or nālī.

#### 17. VETASAPATRAKA.

It is a long sharp cutting instrument shaped like the leaf of the rattan (Calamus Rotang). Its edge is finely serrated and very sharp. The blade and handle are equal in length, measuring four anguli. Bhoja says: "The blade is one anguli wide". It is said to have been used for puncturing vessels in phlebotomy.

## 18. Vaņiša or sharp hook.

In shape it is described to resemble the ordinary fish-hook. Bhoja describes the total length to be six anguli, its hook being half an anguli and its handle five and a half anguli long. The end is bent; the curvature varies and may be shaped like a half-moon<sup>3</sup>.

Nivandha Samgraha, I. viii.

Aştānga Hrdaya Samhitā, I. xxvi.

वैतसपवादि शस्त्रमाह वेतसिमलादि वेतसं वेतसपवं नामशस्त्रं सिरादीनां व्यथन कर्माण-योज्यं। वेतसपववद्दनुरत्वासस्य वेतसं वेतसपवं वेति संज्ञा।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

विषयिति विषयित्यं विषयं मन्स्यविधनीमाष्टः। तत्र तन्त्रान्तरं:— विषये चापि कर्तं ये प्रमाणे तु षडकुले। खानतन्तु तयोरिकमिकं नालायतं भवेत्।

वितसपत्रमिति, वितसपत्रमित वितसपत्रमत्र भोजः
 तीच्यामङ्गुल विस्तारं चतुरङ्गुलायतः।
 मङ्गुलानि तु चलारि इन्तं कार्यः विजानता॥

<sup>&</sup>lt;sup>अ</sup> वितसं व्यथने।

Suśruta says<sup>1</sup>: The end of the hook is sharply edged and is said to have resembled the new leaf of Java (Hordeum vulgare).

It is recommended by Susruta<sup>2</sup> to be used for extraction of foreign bodies, e.g., the extraction of stone from the urethra. Its use is also mentioned for transfixing the membranous expansion in the operation for pterygium<sup>3</sup> and for fixing and dragging the uvula and tonsil before the performance of any operation on these parts<sup>4</sup>. Cakradatta<sup>5</sup> mentions its use for fixing a growth, before its excision by the knife.

चर्डापचाङ्गुलं छन्तं शिषं कार्य्यं सुखं तयोः। चर्डचन्द्राक्तति वक्तं कार्य्यं नात्यानतस्य तु। स्तानतं नामयेत् तत्र विष्यचिभिष्यंदरः। छन्ताययोरन्तरं स्याद् यावदर्डाङ्गुलं सत्।

Nivandha Samgraha, I. viii.

<sup>¹</sup> विङ्गोदन्तप्रङ्गुयानताग्रे तीच्याक्तग्रक प्रथमयवपत्रसुखे।

Suśruta Samhitā, I, viii.

² यटच्छया वा मुचमार्गप्रतिपन्नामन्तरासकां ग्रक्रायमरीं शर्करां वा स्रोतसा अपहरेत् एवं चाशको विदार्थ वा नाड़ीं शस्त्रेण विड्मिनोड्डरेत्।

Suśrutā Samhitā, IV. vii.

³ यहणेयुष्डिकार्मादेवेडि्श: सुनतानन:॥

Aşţānga Hrdaya Samhitā, I. xxvi ----

विष्यस्त्रमाह यहणे इत्यादि सुष्ठ नतं श्रङ्गश्रवत् नमकतं श्राननं सुखं यस्य स तथाविध: सुनतानन: विष्यं मत्स्वविधनवत् विष्योनाम शस्त्रं स्मात्। स च ग्रव्धिकाक्यादेर्यहणे योज्यं। श्रादिपदेण उपजिल्लिकादे परिग्रह:।

Vāgbhatārtha Kaumudī, I. xxvi.

पिड़कामुत्तमाख्याच विड्मोनीट्रेरिइवक्।
 उद्घत्य मधुसंयुक्तै: कषायेरवच्णीयेत्॥

Suśruta Samhitā, IV. xxi.

उत्तमाख्यानुपिड्कां चिद्य विड्योडृताम् ।

Cakradatta, Śukradosa Cikitsā.

It was also used for fixing any growth in the eye, previous to its excision by the mandalagra<sup>1</sup>. For this purpose the Greeks used the vulsellum (myzon). Actius says: "If there is a large and malignant excrescence in the angle of the orbit, the enlarged part must be seized with vulsella and cut off."

Evidently vadisa was used on many occasions when in modern times we use the dissection forceps to steady a part before excision.

Vadiša is described in the Aśvavaidyaka<sup>3</sup> to have been similarly used during the operation of pterygium in horses.

Pālakāpya<sup>4</sup> mentions vadiša which is described as eight aŭguli long, the end being rounded like a wheel. It is to be used for raising the membranes of the eye globe.

Sharp hooks were used by the Greeks and Romans, for similar purposes. The use of the sharp hook for fixing the pterygium is mentioned by Celsus<sup>5</sup>, Aetius<sup>6</sup>, Paul<sup>7</sup> and Ålbucasis<sup>8</sup>.

Its use in the excision of the tonsil is mentioned by Paul.

After the patient being placed in the proper position, he narrates: "We take a hook (tenaculum) and perforate the

Aśvavaidyka, XXX. v. 32.

See foot notes 1, 2 and 3, P. 227.

Actius. vi. 74.

विती निपात्य नुरगं ततोनेवं प्रसारयेत्।
क्रतक्ष्मा भिष्णविद्यान् विष्णिनाचिवत्मं नि।।

<sup>&#</sup>x27;विङ्गं चक्राग्रमष्टाङ्गुलप्रमायमच्ह्योः पटलोद्धरनार्थ चेति ।

<sup>·</sup> Palakāpya, III. xxx.

Celsus. VII. vii.

<sup>6</sup> Aetius. Tet. ii, iii, 60.

Paul. VI. xviii.

Albucasis. Chirrug. ii, 16.

Paul. VI. xxx.

tonsil with it, and drag it outwards as much as we can without drawing its membranes along with it, and then we cut it out by the root with the scalpel suited to the hand, called ancylotomus, for there are two such instruments, having opposite characters.

#### 19. Danta śanku or tooth-scaler.

Its head is half an anguli long. It is quadrangular in shape and has a sharp edge. Suśruta <sup>1</sup> describes the end as slightly bent, sharp and shaped like the fresh leaf of Java. Bhoja <sup>2</sup> describes the end to be like that of the vrīhimukha.

Vāgbhaṭa³ describes a similar instrument called dantalekhana or tooth-scaler. It is also quadrangular in shape, one side being sharp-edged and the opposite side little lengthened. It is •

Nivandha Samgraha, I. viii.

एकधारं चतुष्कोणं प्रवृद्धाक्ति चैकत:।
 दन्तखिखनकं तेन शोधयेह्न्तशर्करान्॥

Aṣṭāṅga Hṛdaya Samhitā, I. xxvi.

दन्तलेखन शस्त्रमाह एक धारिमत्यादि एका घारा यस्य तत् एकैधारं चलार: कोणा यस्य तत् चतुष्कीणं कोण: कोणा इति यस्य प्रसिद्धिः तथा एकतः एकदेशात् प्रवृद्धा वर्षनशीला श्राक्कतिः श्राकारी यस्य तत्त्वधाविधं प्रवृद्धाकृति दन्तलेखनं दन्तलेखनाच्यं शस्त्रं स्प्रात् तेन दन्तिखनाच्छान शस्त्रेण दन्त्रश्रकरान् दन्तिवद्धान् श्रकराच्छान् वेखयेत् कर्शयेदित्यर्थः। दन्ताखिख्यन्ते श्रनेनित दन्तलेखनं दन्तश्रकरा पाथरि इति लोके।

Vägbhatartha Kaumūdī, I. xxvi.

<sup>&</sup>lt;sup>1</sup> See foot note 1. P. 265.

पवं हि क्रियते एती दश्यस्डुर्व्विजानता।
श्रङ्ग वच सुखं तस्य कार्य्यमहीङ्गुलायतम्॥
चतुरस्वं समश्चेव तीच्याधारं समाहितं।
इत्तार्यं तस्य कर्त्व्यं शस्त्रं त्रीहिसुखाक्षति।
कपालिकां शर्कारांच दलस्थानेन शोधयेत्॥

recommended to be used for the extraction of sordes and tartar from the teeth 1.

The procedure of the operation of tooth-extraction is not described in detail in the medical books of the Hindus. But the operation seems to have been well known, for Suśruta distinctly advises the students to practise the operation of extraction on the fruits of Panas (Atrocarpus Integrifolia), Vimbī (Cephalandra Indica), Vilva (Ægle Marmelos) and on the teeth of the dead animals <sup>2</sup>. He also advises us to extract the wisdom teeth and to apply cautery to their sockets <sup>3</sup>. Also when a tooth becomes loose he directs us to extract it and apply cautery to the socket <sup>4</sup>. In the treatment of sinus caused by carious tooth, he advises us to extract the tooth, otherwise the sinus would extend down to the inferior maxillary bone <sup>5</sup>.

श्रहिंसन् दल्तमूलानि शर्करामु इरेट भिषक्।

Suśruta Samhitā, IV. xxii.

- <sup>2</sup> See foot note 2. P. 280.
- उड्ड्याधिकदन्तन्तु ततोऽग्रिमवचारयेत् ।
- क्रिमिदन्तक-वचापि विधि: कार्य्यी विजानता॥

Suśruta Samhitā, IV. xxii,

चलसुड्ल्य च स्थानं विदहेच्छुषिरसा च।

Ibid.

यन्द्रनमधिजायित नाड़ी तंद्रनसुद्धरेत् । किला मांसानि ग्रस्त्रेण यदि नोपरिजोभवेत् ॥ ग्रोधियला दम्नेद्वापि चारेण ज्वलनेन वा । भिनन्त्य पेचिते दन्ते इनुकास्थि गतिधृवं ॥ समूलं दग्रनं तसादृद्धरेद भग्नमस्थि च ॥ चड्नतेत्त्तरे दन्ते सग्रुले स्थिरवन्धने ॥

प्रस्त्रेण दन्तवैदभे दन्तस्लानि शोधयेत्।

Pālakāpya<sup>1</sup> mentions the extraction of tooth of the elephant by means of enīpada which is an iron bar, thirty-two anguli long and equal to the tooth in circumference.

Paul says<sup>2</sup>: "The laminæ which unite to them (the teeth) we may remove as may appear proper, with the concave part of a specillum, a raspatory, or a file." The operation of tooth-extraction was however, not liked by the ancient Greeks as cases in which the operation proved fatal, occurred in their practice. Cælius Aurelianus, Herophilus, and Galen disapprove in general of the operation, except in extreme cases.

It would, no doubt, be interesting to know that in ancient India, the Hindus knew how to make false teeth to be used by men who have lost them either by accident or by extraction by the dentists. In 1194 A.D., Sahabuddin defeated Jayacandra in battle, "and the incident of the body of the rāja being recognised by his false teeth<sup>3</sup>—a circumstance which throws some light on the state of manners" is well known.

## 20. Eṣaṇī or sharp probes.

"The probes", says Caraka 4, "are of two kinds, the hard or

Pālakāpya, III. xviii.

Caraka Samhitā, VI. xiii.

हातिंश्रदङ्गुलायतदशनपितनाइन लौइदर्ष्ड न । एनीपदेन कुर्यादुजुरणं तयो: सम्यक् ॥ ब्रीहिमुखेन च पिरशोध्य सर्वसस्य दलमूलेषु । उणोदकषीतेषु मधुसपिं: पूरणं द्वातु ॥

<sup>&</sup>lt;sup>2</sup> Paul. VI. xxviii,

Elphinstone's History of India, P. 365, 5th Ed.

विविधानिष्यां विद्यान्यद्वीच कठिनामपि। उद्विदेश दुभिनीलेलींद्वानां वा चलाकया॥ गभीरमांसगे देशे पार्च लीद्वचलाकया। एष्यं विद्याद व्रणं नालेविपरीतमतो भिषक्॥

metallic probes, and the soft probes such as the young stems of plants. The hard probes are required for deep sinuses in the fleshy parts and the sides of the body, while the softer varieties are used for probing the superficial sinuses". The ends of the probes are generally shaped like the head of the earth-worms<sup>1</sup>. Susruta<sup>2</sup> describes them to be eight anguli long. They are to be used as probes to ascertain the direction of sinuses.<sup>3</sup> The blunt probes have been described before under the śalākās.<sup>4</sup>

The sharp probes have the shape of a needle and are six anguli long. The other end carries an eye through which is put one end of a caustic thread (i.e., thread soaked in caustic lotion and then dried). The probe is to be used for piercing the tissues through the blind end of the sinus. The end of the thread is next to be withdrawn from the eye of the probe and a tight knot applied with the other end. The intervening bridge of tissues is thus gradually cut and the sinus opened. If the cord be found inefficient for the purpose, a second thread is to be tied similarly.

Ibid.

Aşţānga Hrdya Samhitā, I. xxvi.

एषास्थ्यस्य भस्तमाह गतेरित्यादि एषणीनाम भस्तं गते: नाडीव्रणस्य पूरादिपथस्य भन्देषचे भन्देषचे योज्यं। सा चैषनी श्रन्ता कोमलस्पर्धा, तथा गण्डुपदसुखा, महीलता सुखाकार सुखा च भवति।

Vāgbhaṭārtha Kanmūdī, I. xxvi.

¹ एषची गण्ड्पदाकारसुखी।

Suśruta Samhitā, I. viii.

<sup>🤔</sup> तन नस्त्रभस्ते षण्यावष्टाङ्गुले ।

गतेरन्वेषये अच्छा गण्डुपदमुखेषयी।

See page 155-7.

क्रमदुर्व्यत्तमीरुयां नाड़ीनर्क्यत्रताच या।
 चारसूवेच तां किन्दान्त तु अस्त्रेच वुिंडमान्॥

This method of treatment is recommended for the weak and timid patients. The needle-shaped probe is also to be used in the extirpation of new growths by means of caustic threads. Cakradatta<sup>1</sup> also describes this operation; evidently he copies it from Suśruta. In the Yogaratnākara<sup>2</sup> the verses describing the operation are also quoted. Vāgbhaṭa also mentions a needle-shaped probe for the same purpose.<sup>3</sup>

In treating of fistula-in-ano, Paul quotes from Hippocrates and says 4:—"For Hippocrates directs us to pass a raw thread,

एषण्या गतिमन्तिष्य चारस्वानुसारिणीम् ।

म्वी निद्ध्याद्वयन्ते तथोद्वय्याः निर्हरेत् ॥

म्वस्यान्तं समानीय गादवन्यं समावरित् ।

ततः चार वलं बीत्य स्वमन्यत् प्रवेशयेत् ॥

चाराक्वं मतिमान् वैद्यो यावद्विच्छदाते गतिः ।

भगन्दरेऽप्येष विधिः कार्यः वैद्येन जानता ॥

प्रब्वुंदादिसु चोत्चिष्य मूले स्वं निधापयेत् ।

स्वीभिर्याववक्वाभिराचितं वा समन्ततः ।

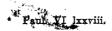
स्वी स्वेण वधीयाच्छित्ने चोपचरेद्वणः ॥

Suśruta Samhitā, IV. xvii.

- <sup>1</sup> These verses are quoted in the Cakradatta, Nādivraņa Cikitsā.
- 5 Also quoted in the Yogaratnākara, P. 346.
- भदनार्थेऽपरा सूचीसुखा सूलिनविष्टखा ।

Aştānga Hrdaya Samhitā, I. xxvi.

अपरसधिषणी शस्त्रमाह । भेदनार्थे इत्यादि भेदनार्थे नाड़ीव्रणाना गितिभेदनर्थे अपरा पूर्व्योक्ताया एषण्या अन्या स्चीसुखा स्चाकार सुखा स्प्रात् तथा सूले स्लदेशे निविष्टं, स्विनवेश योग्यं ख किंद्र यस्त्राः सा मुलनिविष्टखा सिक्किद्रम्लिन्थ्यः । अस्त्रा एषण्यामूले किंद्रवर्षा चारकस्वनिवस्तार्थं । तेन प्रभिन्न दारनिष्काशितेन दृढवसेन चारस्त्रेण नाडीव्रणः प्रकाश्यते ।



Vāgbhaṭārtha Kaumūdī, I. xxvi.

consisting of five pieces, through the fistula by means of a probe having a perforation, or a double headed specillum; and to tie the ends of the thread and tighten it every day until the whole intermediate substance between the orifices be divided and the ligatute fall out". Hippocrates 1 describes minutely the apolinose and recommends it for those who from timidity avoid a surgical operation. Celsus recommends the thread to be smeared with some escharotic continent. The process, he says, is slow but free from pain2. Albucasis 3 also approves of the operation according to circumstances. The operation called apolinose i.e., by the ligature, is very celebrated. Ambrose Pare, Foubert, Camper, Giudo de Cauliaco and Rogerius approve of the ligature. It has been recommended by some of the modern surgeons4. The operation is still practised in India by the Madrasi specialists for fistula-in-ano.

Vāgbhaṭa <sup>9</sup> describes copper probes having the sharp ends shaped like the buds of Kuravaka (Baleria Cristata) to be used in

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

श्वाका शस्त्रं श्रङ्गुलि शस्त्रश्चाह तासीत्यादि दिसुखा, दिदारा, सुखे, सुखप्रदेशे कुरवका कृतिः, रक्तिक्छीपुण सुकुलकारा, तासी, तासमयी, श्रलाका, श्रलाका शस्त्रं स्प्रात्। तया श्रलाकाया लिङ्गनाशं, कफोत्यं पटल संज्ञकं चच्चरीग विशेषं विध्येत्। विध्येदित्यकेन क्छेदः।

<sup>1</sup> Hippocrates. 'De Fistulis'.

<sup>&</sup>lt;sup>2</sup> Celsus. vii. 4.

<sup>&</sup>lt;sup>3</sup> Albucasis. Chirrug. ii. 80.

Lancet. vol. 1. 1845, new series.

तासी थलाका दिसृखा सुखे कुरवकाक्ति:।
 लिङ्ग नागं तथा विध्येत्॥

the operation of cataract. Susruta¹ describes such a probe to be eight anguli long, made of copper, or iron, or gold, the ends being shaped like buds. A thread is spirally twisted round the middle of the instrument for a length of a thumb's breadth, to afford a firm grasp by the surgeon's fingers. This instrument must not be rough, thick or very sharp, for then there would be a greater chance of the eye being injured more than is necessary and at many places. So also in couching of cataract, Celsus says: "Then a needle is to be applied, sharp so as to penetrate, but not too fine."

Pālakāpya <sup>8</sup> mentions eṣaṇī in the surgical treatment of diseases of the elephants. He describes three probes,—smooth and shaped like the collyrium rods. They are recommended to be ten, twenty and thirty anguli long respectively.

यखाका कर्कशाय्लं खरा दोषपरिप्रुतिं। इयां विश्वालं स्युलामा तीच्या हिंसादनेकधा॥ जलास्नावन्तु विषमा क्रियासङ्गमथास्थिरा। करोति वर्जिता दोषेस्तसादिभिर्हिता भवेत्॥ ष्रष्टाङ्गुलायता मध्ये स्त्रेण परिवेष्टिता। ष्रङ्गुष्ठ पर्व्वसमिता वज्ञायोर्गुकुला कृति:॥ तासायसी शातकीकी श्रलाका स्वादनिन्दता।

Suśruta Samhitā, VI. xvii.

स्थिरा सही च कर्त्तव्या व्रणानामिषणी भवेत्। हत्ता गण्डुपदसुखी प्रमाणे विषयाङ्गुली ॥ सुवर्णकृष्यतासाणामायसी प्रञ्जजाऽपि वा। दन्तास्थिवेतदाक्णामिषणी दाक्णा भवेत्॥

Pālakāpya, 1II. i.

एवणी दशाङ्गुला विश्वयङ्गुला विश्वयङ्गुला यथायोगमञ्जनशलाकाक्रति सुखतः स्रच्या समा चैवमितास्त्रिक एवच्यः प्रमाणतः कार्याः ।

Ibid, III, xxx.

<sup>&</sup>lt;sup>2</sup> Celsus, VII, viii,

The operation of couching for cataractis essentially an Indian operation; and Susruta describes the operation minutely as follows:—

The operation of couching for cataract.

Susruta says<sup>1</sup>: "Now we shall describe the treatment of cataract caused by phlegm. If inside the crystalline lens, anything is seen like a half-moon-shaped drop of water or pearl, hard, irregular

8 से भिने जिङ्गनाथे त नर्मा वच्यामि सिहये। नचेदर्डे द्वर्माम्बविद्मुताक्षति: स्थिर:॥ विषमी वा तनुर्माध्ये राजिमान्वा वहप्रभ: । दृष्टिस्थी बदाते दीष: सर्वा वा सुबोहित:॥ किम्धिखन्नसा तसाय काली नात्युणशीतली। यन्तितस्योपविष्टस्य खान्नासां पथ्यतः समं॥ मितनान ग्रुक्तभागी ही क्षणामा काह्यपाइत:। उन्मौत्य नयने सम्यक् शिराजाल विवर्क्किते॥ नाधी नोईश्व पार्श्वाभ्यां किंद्रे दैवक्रते तत:। भाजाक्या प्रयत्नेन विश्वस्तं यववत्रया॥ मध्य प्रदेशित्यङ्ग एस्थिरहस्त गरहीतया। दिचिंगीन भिषक् सव्यं विध्येत सब्येन चैतरत्॥ वारिविन्द्वागमः सम्यक् भवेच्छब्दस्या व्यधे। संसिच विद्यमावन्तु योषित्सान्येन कोविदः॥ स्थिरे दोषे चले वापि खे दयेदचि वाचात:। सम्युक् श्रवाकां संस्थाप्यास्यङ्गेर निवानाश्रनै: ॥ भवाकागेण त तती निर्मिखेह्मिएन एवं। विध्यतो योऽन्य पार्श्व उत्तास कहा नासिकापट ॥ उच्चिक्षनेन इत्ते यो दृष्टिमन्डलजः कपः। निरभ दव घर्मांगुर्थंदा दृष्टि: प्रकाशते॥ तदासी लिखिता सम्यग् जेया याचापि निर्व्यं था। ततो इष्टेषु रुपेषु श्वाकामाहरेकानै:॥

or thin, striated or shinning, painful or red, caused by the deranged humours, the oleaginous applications and fomentations are to be tried first at a time when it is neither hot nor cold; then he (patient) is to be ligatured after having him seated conveniently, and should be directed to look towards his own nose. The intelligent (surgeon), then seperating the white part from the black part and the external canthus of the eye after opening it, avoiding the vascular network, and leaving the parts above and below intact, is to pass a yavamukhī śalākā (or sharp needle having its end resembling a wheat) through a natural opening on the side, steadily holding the rod with the thumb, index and middle fingers. If the operation be required on the right eye, the left hand, and if on the left eye, the right hand of the surgeon should use the needle in puncturing. A successful puncture is known by the escape of a drop of fluid and an audible sound. The experienced surgeon is to sprinkle woman's milk just after the puncture, and keeping the needle there, whether the deranged humour be movable or not, should apply fomentations externally by means of oily remedies for the deranged air. The crystalline lens is next to be scarified by the sharp end of the needle. Then keeping the needle fixed in the side of the eye, the patient should be directed to sniff so as to destroy the phlegm of the lens. The proper scarification will be indicated when the lens appears brilliant as the sun uncovered by clouds. Then the vision being clear, the needle in the side of the eye, is to be removed; and the eye is to be well

> ष्टतेनाभ्यव्य नयनं पस्त्रपट्टेन बेष्टयेत्। ततो ग्रहे निराबाधे शयीतोत्तान एव च॥

soaked with ghee (melted butter) and bandaged properly."

Vāgbhaṭa also discribes the operation similarly.

To this we may compare the account of the operation as given by Celsus. He "lays it down as a rule, that when the suffusion is small, immovable, and of the colour of sea water, or of shinning iron, and if a small degree of light can be percieved at the side, there is reason to hope well of the case. He forbids us to operate until the disease has attained a proper consistence. He directs us to place the patient opposite the operator, who is to sit on a higher seat, while the patient's head

श्रथ साधारणे काले ग्रुड्संभोजितातान:। देशे प्रकाशे पूर्व्यक्ति भिषग् जानुच पीठग:॥ यान्त्रितस्रोपविष्टस्य स्त्रिज्ञाचस्य मुखानिलै:। अङ्गुष्ट स्टिते नेवे हणी हशेत्यतं मलम् ॥ खनासां प्रेचनाणस्य निष्तम्यं मुर्प्ति धारिति । क्रणादहीङ्गलं मुक्का तदर्जाईमपाङ्गतः॥ तर्ज्जनीमध्यमाङ्गुष्ठैः श्लाकां नियलं भृताम् । दैविच्छद्रं नयेत् पाश्वादूर्बमामस्ययद्भिव ॥ सव्यं दिचणहसीन नेवं सव्येन चेतरत। विध्येत् सुविङे शन्दः स्थादरुक चान्नुलवस्रुतिः ॥ सान्वयद्वातुरं चानु नेवं सन्येन सेचयेत्। यलाकायासतोऽयेण निर्लिखेन्नेचमख्डलं ॥ चवाधमान: श्नकैर्नासां प्रतिनुदंसत:। उच्छित्रनाद्यापहरेट्ट दृष्टिमख्लगं कफ्स । स्थिरे दोषे\_चले चापि स्वे दयदिचवाद्यत: ॥ भव दृष्टेषु इपेषु श्रालाकामाहरेक्क्नै:। चताप्रतं पितुंदत्ता वडाचं शाययेत्तत: ॥ विद्वादनीन पार्श्वेन तमुत्तानं दयीर्व्यं वे। निवाते श्यनेऽभ्यक्तशिरः पादं द्वितेरतम्॥

Aştānga Hṛdaya Samhitā, VI, xiv.

is held by an assistant. The sound eye is to be previously covered up with wool. If the left eye is affected, the operator must use his right hand, and vice versa. A needle which is sharp and not too slender is to be passed direct through the two coats at a place intermediate between the temporal angle and the black of the eye, and towards the middle of the cataract. When the needle has perforated far enough, which is readily known by the abscence of resistance, it is to be turned so as gradually to remove the cataract below the region of the pupil and this object being attained it is to be strongly pressed to the lower part. If it remain there the operation is completed, but if it return, it is to be cut and torn by the needle into many pieces, in which state they are easier depressed, and prove less troublesome. The needle is then to be drawn out direct and soft wool smeared with white of an egg, and other antiinflammatory applications are to be used. Quiet, restricted diet, and soothing treatment will be proper. 1" Paul 2, Mesue 3, Albucasis 4, Rhazes 5 and others also describe the operation of couching in similar terms. Albucasis gives figures of these needles.

The operation is still practised in India by the mals who consider themselves specialists in diseases of the eyes.

#### 21. SARPĀSYA.

Vāgbhaṭa describes an instrument having its end resembling

<sup>&</sup>lt;sup>1</sup> Celsus. vi. See Adam's Commentary to Paul VI. xxi.

<sup>&</sup>lt;sup>2</sup> Paul. VI. xxi.

Mesue. De Aegr. oculi, 15.

<sup>4</sup> Albucasis. Chirrug, Il. 23.

<sup>&</sup>lt;sup>5</sup> Rhazes. Ad mansor.

the mouth of a snake <sup>1</sup>. The blade is said to be half an anguli long. It is advised to be used for excision of the nasal and aural polypi.

The fact that it was able to work inside the nose and the auditory canal shows that it could not have been of any great breadth, possibly less than a quarter of an inch at the most. The exact shape of the sarpāsya can not be determined with certainty. The Greeks however used for the same purpose, "a polypus scalpel, having its extremity shaped like a myrtle leaf," which was a double instrument, the other end being a scoop <sup>2</sup>.

#### GOLD OR SILVER KNIFE.

To cut the navel cord, Caraka <sup>3</sup> recommends the use of a knife, made of gold, or silver, or iron. To make gold and silver knives of sharp edges seems absonous to our reason, but we must remember that to cut the navel cord, a very keen edge is not required, and even now the purpose is often served by the native dhāis with a piece of split bamboo.

# ¹ सर्पासा प्राणकर्णार्थक्छेदनेऽक्षाङ्गुलं फीले॥

Aştānga Hṛdaya Samhitā. I. xxvi.

सर्पासं नाम श्रृत्वनाह । सर्पासं इत्यादि सपासं नाम श्रस्तं नासिका कर्णार्शसां छिदने योज्यं तच फले श्रृङ्गुलाईपरिनितं श्रुडाङ्गुलपरिनित फलकिनत्यथं:। श्रसा सपेसुखसहश सुखलात् सर्पास्त्रिति संज्ञा।

Vāgbhatārtha Kaumūdī. I. xxvi.

Paul. VI. xxv.

See foot-note 4. P. 65.

#### PRATUDA.

Susruta mentions it as a knife to be used for making scarifications on the body of a lunatic.<sup>1</sup>

The mode of holding the sharp instruments.

Susruta says <sup>2</sup>: "The vrddhipatra is to be held at the junction of the handle and the blade; and all instruments used for incision should be held similarly. The vrddhipatra and mandalāgra, if used for scarification, should be held with the hand raised a little; when used for evacuating abscesses, they, as well as all other instruments, should be held by the fore part of the handle. But in the case of children, old or delicate or timid persons, women, and kings and princes, abscesses should be evacuated with the trikūrccaka. The vrīhimukha is to be held with the thumb and forefinger, its handle being covered within the palm. The kuthārikā is to be held in position with the left hand, and struck with the middle finger when let go forcibly from the under surface of the thumb of the right hand. The ārā, karapatra and eṣaṇī should be held at their extremities.

Suśruta Samhitā, VI. liii.

विषासथयोग यहण समासीपायः कर्मस वस्ति। तत बिह्रपत्रं बन्तफलसाधारणे भागे गृहत्तीयाहेदनान्येवं सर्व्वाणि । बिह्रपत्रं मण्डलायत्र किस्तिदुत्तानपाणिनां लेखने वहुयोऽवनार्थं बन्ताये विस्तावणानि । विश्रेषेण वालवहुससुनुमार भीर नारीणां राज्ञां राजपुत्ताणास्त्र तिकूर्वकेन विस्तावयेत् । तल प्रस्कादित वन्तमङ्गुष्ठ प्रदेशिनीभ्यां ब्रीहिसुखं । कुठारिकां वामहस्त्रस्तामित-रहस्त मध्यमाङ्गुखाङ्गुष्ठ विषठस्रयाभिहन्यात् । आराकरप्रवेषण्यो मूले । श्रेषाणि त यथायोगं गृहत्तीयात् ।

Suśruta Samhitā, I. viii.

प्रतुदैर्दारयेत् वैन' मर्खाघात' विवर्ज्जयेत्।
 सिंपाने जरतक्रपे सतत' वा निवासयेत्॥

The other instruments are to be held as required in particular cases." Vāgbhata also gives similar directions 1.

The practical training in surgical operations.

Suśruta says <sup>2</sup>: "Even after a pupil has mastered the whole of the medical treatises, the preceptor should instruct him practically how to perform surgical operations and how to administer oils and other medicines. However learned he may be in books, he cannot be fit for surgical practice, unless he has acquired the practical training. Therefore the preceptor should show his pupils the methods of operations, of incision, excision and division, upwards and downwards on the pumpkin, bottle-gourds, water-melons, and the three varieties of cucumbers—Trapuṣa (Cucumis Sativus), Ervārūka (Cucumis Utillissimus), and Karkarūka (Cucumis Melo).

केद भेदिन लेखार्थं म्रस्तं वन्त फलान्तरे । तर्ज्यंनी मध्याङ्ग्रपेर्यः श्लीयात् सुसमाहितः । विस्नावणादि वन्ताये तर्ज्यं बङ्गुष्ठके न च । तल मक्दन वन्तायं याद्यं ब्रीहिसुखं सुखे । मूलेषाइरणार्थानि क्रिया सीकर्यंतोऽपरं ॥

Astānga Hrdaya Samhitā. I. xxvi.

Suéruta Samhitā, 1. ix.

The operation of puncturing or tapping may be demonstrated on leather bags, bladders and pouches, filled with slush; scarifications, on stretched pieces of leather covered with hair; opening on the veins of dead animals or on stalks of water-lily; probing on worm-eaten wood, bamboo, reed, tube or dried bottle-gourd; extraction, on the pulp of jack fruit, the Bael fruit (Ægle Marmelos), Vimbī fruit (Cephalandra Indica) or on the teeth of dead animals. Evacuation on a lump of wax applied to a board of Salmali wood (Bombax Malabaricum); sewing, on the two ends of a thick piece of cloth or soft leather; bandaging on the limbs of a dummy (human figure made of cloth and clay), bandaging the root of the ear, on a piece of soft flesh, or the stalk of a water-lily; application of cauteries, on pieces of flesh; introduction of tubes for clysters (urethral, rectal and vaginal) and wound-syringe, on the spout of an earthen vessel filled with water, or on the mouth of a bottle-gourd or similar objects."

## CHAPTER VII.

### THE ANUŚASTRA.

The anusastra means substitutes for cutting instruments. They are the following 1:—

1. Bamboo. 2. crystal. 3. glass. 4. ruby. 5. leeches. 6. fire. 7. caustics. 8. the nails. 9. leaves of Goji (Elephantobus Scaber), 10. Sephālikā (Nyctanthe Arbortristris), and 11. Sākhā (Tectona Grandis). 12. young stems of plants. 13. hair 14. finger.

These are advised to be used in case of infants or timid persons or when the proper instruments are not available.<sup>2</sup>

#### 1. Вамвоо.

A piece of split bamboo is said to have been used for cutting through and cutting into some parts of the body. It is still used by the native dhais or midwives for cutting the funis.

A piece of bamboo is directed to be used for applying pressure on small boils to cure them by subsidence <sup>3</sup>. For the same purpose, the pressure of the thumb is also recommended <sup>4</sup>.

Ibid.

Cakradatta, Vraņašothā Cikitsā.

भनुश्रस्त्राचि तु त्वनसारस्प्रिटककाचकुरुविन्द्जलीकाग्निचारनखगोजीश्रिमालिका भाकपव करीरवालाङ्गुखय इति ।
 Suáruta Samhitā. I. viii,

श्रियनां सम्बभीराणां सम्बाभावे च योजयित्। लकसारादि चतुर्व्वर्गे हिदो मेदो च वुडिसान्॥

इतेषु दोषेषु यथानुपूब्व ग्रन्थी भिषक् सं म ससुत्यिते तु ॥ सिन्नस्य विस्नापनमेव कुर्यादङ्गुष्टली होपलवेग्र दस्है:।

<sup>\*</sup> अभ्यज्य खेदियत्वा च वेग्रनाद्या तत: श्रने:।

विकापनार्थं सङ्गीयात् तत्तीनाङ्गुष्ठकेन वा ॥

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#### BAMBOO.

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श्रीयग्रनां मस्त्रभीक्षां मस्त्राभावे च योजयेत्। लक्क्षारादि चतुर्व्वर्गे छेये भेये च बुडिमान्॥

Ibid.

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इतेषु दोषेषु यथानुपूब्वे ग्रयी भिषक् से म समुख्यिते तु ॥ सिक्तस्य विद्वापनमेव कुर्यादङ्गुष्ठलोच्चोपलवेख द्रस्कैः।

Ibid. IV. xviii.

मभ्यन्य सेदियता च विग्रनाद्या तत: शनै:। विस्नापनार्थे सन्नीयात् तत्त्वनाङ्गुन्नकेन वा॥

Cakradatta, Vraņasothā Cikitsā.

भनुशस्त्राचि तु त्वकसारस्प्रिटिककाचकुरुविन्द्जलीकाग्निचारनखगोजीश्रिफालिका श्राक्षपत्र करीरवालाङ्गुलय इति ।
 Suárruta Samhitā, I. viii.

Bamboo is also mentioned to have supplied largely the materials of splints for treatment of fractures and dislocations. For this purpose it is to be split into thin layers. Split bamboo is still used for the treatment of fractures by the kavirajes and might advantageously be used by the modern surgeons as a cheap and easily available material for splint.

#### Dissection.

It is generally supposed that the practice of dissection of the human body for anatomical studies was unknown to practice of the ancients. But the human dissection is unmistakably referred to in the Susruta Samhita. 2 Brushes made of bamboo, barks of trees, grass roots, and hairs are mentioned as instruments of dissection. "Thus a body should be secured which is complete in all the parts and which is of a person who was not more than 100 years old, nor who died from the effects of poison or of a chronic disease. Having cleared the intestines of any facal matter, the body should be well wrapped either in Munia (Saccharam Munia), or grass, or barks of trees or hemp etc., put inside a cage which should be firmly fastened, in a solitary spot, in a calm river and thus allowed to decompose. After seven nights, having taken out

# विभग्नस्य नः द्वारा विस्तयस्य न वन्ध्येत् । स्वयेतवनीतनैरस्यपमस्य विध्येत् ॥

Hārita Hamhitā, II.I lvi.

विकात्सनसगायमिविवीपहतमदीवियाविधीिकृतसवर्षशतिकः निःस्ष्टाक्रपुरीवः पुरुषम-वहन्यामापगायां निवदः पद्मारस्यं सञ्चवत्कलकुण्यस्यादीनामन्यतमिनविष्टिताङ्गमप्रकाणे देशे कोषयेत् सम्यक् प्रकुषितखोद्गृत्य ततो देषः सप्तराषादुशीर वालवेख वत्कल कृषीनामन्यज्ञमेन जनै: यनैरवधर्वयं स्तगादीन् सर्वानिव वाष्ट्रास्थनगाङ्गप्रसङ्ग विशेषान् वद्योक्तान् सच्चयेश्वच्याः। Subruta Subhitä, 111, v.

the thoroughly decomposed body, it should be slowly rubbed with a brush made either of Uṣṣ̄ra (Andropagon Muricatus) or hair, or bamboo, or barks of trees, examining at the same time with the eyes, every division and sub-division of the body, external or internal, beginning with the skin, as delineated in the śāstras." Animal anatomy was also thoroughly understood as each part of the body had its own distinctive name.

Hoernle<sup>1</sup> says: "Probably it will come as a surprise to many as it did to myself, to discover the amount of anatomical knowledge which is disclosed in the works of the earliest medical writers of India. Its extent and accuracy are surprising, when we allow for their early age—probably the sixth century before Christ—and their peculiar methods of definition.\*\*\*Of the practice of such dissection in ancient India we have direct proof in the medical compendium of Susruta, and it is indirectly confirmed by the statements of Caraka. It is worthy of note, however, that in the writings of neither of these two oldest Indian medical writers is there any indication of the practice of animal dissection."

The Greeks did not practise disection of the human body. "The anatomical knowledge of the Hippocratists was derive chiefly from dismemberment of animals, experience in slaughtering and sacrifices, and from the observation of surgical cases. Systematic dissection of the human body was out of the question owing to the religious precepts which strictly enjoined immediate burial, and to the superstitious horror of the dead which then prevailed. The supposition that outstanding individual investigators, upon rare occasions, did not hesitate to examine

<sup>&</sup>lt;sup>1</sup> Hoernle. Osteology. Preface. iii.

human bodies or parts of bodies (particularly) bones, in order to correct prevailing opinions, is one which, if not susceptible of direct proof, is at least probable. This supposition, besides being borne out by many statements on the part of ancient writers, is the more probable since the bodies of savages, traitors and criminals were outside the pale of religious ordinances and were therefore available, as were also accidentally obtained portions of the body, to satisfy the curiosity of scientific investigators. No one of the oft-quoted extracts from the Hippocratic writings, supposed by individual historians to refer to human dissection, is quite conclusive, whilst nowhere is there in the pathology of the day any definite trace of anatomical research upon the bodies of those dead of disease. other hand comparisons are frequently instituted by the Hyppocratists referring to facts acquired through zootomy or to anatomico-pathological discoveries such as might have been made in the slaughtering of beasts."1

The study of anatomy received its impetus from the Alexandrian School. "Herophillus improved the technique and developed the terminology of anatomy and enriched it by valuable discoveries made in the dessection of human bodies, particularly in the knowledge of nerves, vessels and viscera, but also in that of the eye. With his works, systematic anatomical investigation may in fact be said to begin."<sup>2</sup>

"Like Herophilus, Erasistratos made a successful study of anatomy, even surpassing the former in knowledge of details, and in a series of observations upon the cadavers of men and

<sup>1</sup> History of Medicine. Neuberger. P. 150.

<sup>&</sup>lt;sup>2</sup> Ibid. P. 177-8.

animals, corrected his own mistakes as well as those of others. His greatest achievement was in the study of nerves and vessels."

## 2, 3 AND 4. CRYSTAL, GLASS AND RUBY.

These are recommended to be used for cutting through and cutting into some parts of the body.

Glass vessels for preparing medicines are often mentioned. Sārngadhara<sup>2</sup> used it for purifying mercury.

#### 5. LEECHES.

Leeches are described to be the mildest of all means for extracting blood, and are recommended for princes, childern, women, and timid people<sup>3</sup>.

Twelve kinds of leeches are described4; six of them are poisonous and six, non-poisonous.

काचकूष्यां विनिचिष्य ताश्व सददस्रसुद्रया। विलिष्य परितो वज्ञं सुद्रां दल्लाच शौषयेत॥

Sārngadhara Sanigraha, II. xii.

³ चृपा श्रवालस्थिवर भीकदुर्व्यलनारी सुक्तभारायामनुग्रहार्थं परमसुक्तमारोऽयं श्रोणितावसे च नोपायोऽभिहितो जलीकस:॥

Suśruta Samhitā, I. xiii.

\* जलमासामायुरिति जलायुका जनमासामोक इति जलीकसः। ता हादश तासां सिवधाः स्रष्ट् तावत्य एव निर्व्विषाः। तत्र सिवधाः कृष्णा कर्न्त्र्या श्रलगार्हा इन्द्रायुषा सासुद्रिका गोचन्दना चेति। तास्त्रञ्जनचूर्णवर्णा पृष्ठ्यिराः कृष्णा। विद्यामत्स्यवदायता किन्नोन्नतः कृष्यः कन्त्र्या। रोमधा महापार्त्रा कृष्णसुख्यलगर्द्धा। इन्द्रायुधवदूर्श्वाराजिभियितिता इन्द्रायुधा। ईषदिसतपीतिका विचित्र पृष्णाकृतिचिता सासुद्रिका। गोवधवयवदधीभागे विधान्नताकृतिरणुसुखी गोचन्दनेति। ताभिर्दृष्टे पुरुषे दंशे श्रयष्ट्रपतिभातं कंष्डुमूर्ष्कां

History of Medicine. Neuberger. P. 181.

The poisonous leeches are :--

1. Kṛṣṇā:—it is of the colour of black collyrium and has a broad head.

ज्वरीदाहम्किर्दिर्भदः सदनमितिलिङ्गानि भविता। तच महागदः पानालेपननस्य कर्मादियूप-योज्यः। इन्द्रायुधादष्टमसाध्यसित्येताः सविषाः सिवितित्सिता व्याख्याताः। अय निर्व्विषाः। कपिला पिङ्गला श्रङ्गसुखी सूषिका पुग्छरीकसुखी साविरकाचिति। तच मनःशिलारिञ्चता-भ्यामिव पार्थाभ्यां पृष्ठे सिग्धसुद्गवर्णा कपिला। किखिद्रका इत्तकाया पिङ्गाग्रगाच पिङ्गला। यक्तवर्णा श्रीष्ठपायिनी दीर्घतीच्यासुखी श्रङ्गसुखी। सूषिकाक्तति वर्णाऽनिष्टगन्या च सूषिका। सुद्भवर्णा पुग्छरीकतुत्व्यवक्रा पुग्छरीकसुखी। श्रिग्धा पद्मप्रविष्णाद्मशाङ्गलप्रमाणा साविरका साच पश्चर्षे। इत्येता श्रविषा व्याख्याताः।

तासां प्रयहणमार्द्रचर्मणार्थेव्वा प्रयोगेर्ग्य होयात्। प्रयेनां नवे महित घटे सरसाड़ा-गोदकपद्मनावाप्य निदध्यात्। भन्यार्थे चासासूपहरेक्द्रैवलं बह्नूरमीदकांय कल्टां-यूर्णीक्रत्य यय्यार्थे व्यमनीदकानि च प्रवाणि। हाहान्नाहाचान्यज्ञलं भन्त्यस्य द्यात्। सप्तरावात् सप्तराचात्र घटमन्यं संकामयेत्। भवति चाच।

> स्थूलमध्याः परिक्रिष्टाः पृथ्यो मन्दिवचेष्टिताः । स्र्याहिस्योऽस्यपायिन्यः सविषास न पूजिताः ॥

षय जलीकोऽवसेकसाध्यव्याधितसुपवेश्य संवेश्य वा विरुत्त्य वास्य तमवकाशं सङ्गोसयपूर्वेर्ययक्तः: स्रात्। ग्रहोतास ताः सर्वपरजनीकत्कोदक प्रदिग्धगावोः सिललसरकमध्ये
सुह्रक्तिस्यताविगतक्कमा ज्ञाला ताभीरोगं ग्राह्यत्। स्त्याग्रकार्द्रपिपुञ्जोतावन्छनां क्रला
सुख्यसपाहण्यादग्रह्वन्ये चौरिवन्दुं शोणितविन्दूं वा द्यान्छस्वपदानि वा कुर्वीत यदोवमि न
ग्रह्मोयात्तरान्यां ग्राह्यत्। यदा च निविश्यतेऽश्वमुरवदाननं क्रलोन्नस्य च स्कर्त्यं तदा
जानीयाद ग्रह्वातीति ग्रह्वन्तौं चार्द्रवस्तावन्छन्नां धारयत् सेचयेच । दंग्रे तोदकन्छुपादुर्भावैर्ज्ञानीयान्छुद्धमियमादत्त इति ग्रह्वमाददानामपनयेत्। अय शोणितगत्त्रेन न सुन्धिनसुखनस्याः
सेन्यवपूर्णनाविकरित्। अय पतितां तख्डुलकन्छनप्रदिग्धगावौं तैललवणायक्तसुखीं वामहस्ताङ्गुष्ठाङ्गुलीभ्यां ग्रह्वीतपुन्कां दिवणहस्ताङ्गुष्ठाङ्गुलीभ्यां श्रने: श्रनेरनुलोममनुमार्ज्ञयेदासुखाद्दामयेत्तावदावत्सयग्वान्तिङ्कानीति। सयग्वान्ता सिललसरकन्यसा भोतृकामा सती
चरित्। या सीदित न चेष्टते सा दुर्ब्यान्ता तां पुनः सयग्वामयेत् । दुर्ब्यान्ताया व्याधिरसाध्यद्वन्द्वसदो नाम भवति। श्रय सुवन्तां पूर्ववत् सिन्दस्थात् श्रीणितस्य च योगायोगानवेत्त्रा
जलीकोत्रयान्यभुनावषद्वयेन्छीताभिरिद्वय परिषेचयेवभीत वा व्रयं काषाय मभुर सिग्धश्रीतैष्य
प्रदेवैः प्रदिद्यादिति।

Suśruta Samhitā, I. xii.

- 2. Karvūrā:—it is as long as an eel with elevated stripes across the abdomen.
- 3. Alagarddā:—it looks as if covered with hair and has large sides and black mouths.
- 4. Indrāyudhā:—or rain-bow coloured; it has rain-bow coloured longitudinal stripes on the back.
- 5. Sāmudrikā:—it is of dark yellow colour and has variegated flower like spots on its body.
- 6. Gocandanā:—it has a bifurcated tail like the scrotum of a bull and a small mouth.

#### The non-poisonous ones are-

- 1. Kapilā or the greenish one;—it has its two sides of the colour of orpiment, and on its back, it is smooth and of the colour of a green pea.
- 2. Pingalā or twany;—it is of a reddish-brown colour, has a round body and moves quickly.
- 3. Sanku-mukhī or bluish-red;—it is of the colour of the liver, sucks quickly and has a long sharp mouth.
- 4. Mūṣikā or rat-like;—it has the shape and colour of a rat's tail and emits a disagreeable smell.
- 5. Pundarika-mukhi or lotus-faced;—it is of the colour of a green pea and has a mouth like a lotus.
- 6. Savarikā;—it is slimy, coloured green like a lotusleaf and eight angulil long; it is to be used in veterinary practice.

The non-poisonous leeches generally live in meadows and fresh water. They are to be caught with a piece of wet leather and

kept in a new large earthen pot filled with mud, water, green fungi, dry flesh, etc. The water is to be changed every third day and the pot every seventh day.

To apply leeches, the patient is directed to lie down and the part is to be rubbed dry with powdered cow dung and earth. The leech is then to be smeared with a paste containing turmeric, mustard and water, to excite them, washed thoroughly with water and then applied, its body being covered with a piece of wet cloth. To fix it quickly, a drop of milk or blood is to be applied over the diseased part, scarification of which is also recommended instead. When the leech has removed the necessary quantity of blood, a small quantity of salt is advised to be sprinkled upon its head to make it drop off. Then the leech is to be put upon some powdered rice and its mouth is advised to be smeared with oil and salt.

Then it is to be stripped and put in fresh water, and should be used again, if it moved, but if languid, thrown away.

The leech-bites are to be smeared with honey, cold water and astringent substances, or poulticed.

Vāgbhaṭa also gives similar directions for the application of leeches.<sup>1</sup>

ज्लीकसन्तु सुखिनां रक्तसावाय योजयेत्। दुष्टान्तुमत्स्य भेकाहि शवकोषमलोइवाः। रक्ताः श्वेता ध्यं क्रणायपलाः स्पूलिपिच्छिलाः॥ इन्दायुधविचित्रोर्द्दुराजयो रीमशाय ताः। सविषा वर्ज्ययेत्ताभिः क्रण्डुपाक ज्वरसमाः॥ विषपित्तास्तनुत् कार्य्यं तत ग्रडाम्बुजाः पुनः। निर्विषाः श्रेवलस्थाना इत्ता नीलईराजयः॥

Dr. Ray has clearly shown that "the discription of leeches as given by Rhazes agrees almost word for word with that of Suśruta (Sanasrad) in many places". He describes the parallelism at length and comes to the conclusion "of the use of a chapter of the Susruta or some such work."

# 6 AND 7. FIRE AND CAUSTICS.

The use of cauteries in surgery has been described before under the head of the accessory blunt instuments 2.

कषाय पृष्ठासन्बद्धाः कि ज्ञित् पौतदराश्व याः॥ ता भव्यसम्यग् वसनात् प्रततन्त्र निपातनात्। सीदनी: सलिलं प्राप्य रक्तमत्ता इति त्यजीत्।। षयेतरा निशाकला युत्ते उन्भसि परिप्रता:। अवन्तिसीमे तक्षेवा पुनयायासिता जले॥ लागयेद एतसत्साङ्ग शस्त्र रता निपातनै:। पिवनीबद्रहत खन्धान्छादयेन्स्ट्रवाससा॥ संप्रताङ्ग्ण गुधासाञ्चलीका दृष्टशोणितमः। षादते प्रथमं इंस: चीरं चीरोदकादिव॥ दंशस तीदे करणुं वा मीचियेहामयेच ताम्। पटतैलान्नवदनां सच्या क्राच्छन क्चिताम्॥ रचन् रक्तमदाद भुय: सप्ता इं वा न पातयित्। पूर्ववत् पटुता दाश्चं सम्यग् वान्ते जलोकसाम्। क्तमीऽतियोगामाध्यर्वा दुर्व्वान्ते स्तब्धता मदः॥ ष्यवात्यव ताः स्थाप्या घटे स्त् साम्बार्भिन। लालादिकोथ नागार्थं सविषाः सुग्रस्तदन्वयात्।। त्रग्रही सावयेदंशान् इतिद्रा गुड़माचिके:। शतधौताज्यपिचवस्ततो खीपाश्च श्रीतला:॥

Aştanga Hrdaya Samhitā, I. xxvi.

<sup>1</sup> History of Hindu Chemistry, Introduction P. laviii,

<sup>&</sup>lt;sup>2</sup> See Page 213-9.

## 8 AND 14. FINGERS AND NAILS.

The uses of surgeon's fingers and nails in surgical operations has been described before 1.

#### 9,10 AND 11. LEAVES.

Rough leaves such as those of Fig trees (Ficus Indicus), Goji (Elephantopus Scaber), Śephālikā (Nyctanthes Arbor-tristis) and Śaka (Tectonia Grandis) are recommended for scarifying abscesses if they do not heal up after repeated opening by the knife. If there is any formation of pus in the mouth or eyelids, it may be evacuated with these leaves (Susruta)<sup>2</sup>. These leaves are also to be used for bleeding the gums in gingivitis.

To cover the wounds, Susruta gives a list of leaves to be used according to the nature of the wound and season of the year<sup>3</sup>:—

For air-deranged wounds;—use leaves of Eranda (Ricinus Communis), Bhūrjapatra (Betula Bhojpatra), Pūtika (Caesalpinia Bonducella) and Haridrā (Curcuma Longa).

Suśrutā Samhitā, IV. xxii.

<sup>1</sup> See Page 199-202, and 204-5.

चंशोध्योभयतः कार्यः शिरस्रोप कुशि तथा।
 काकोडुम्बरिका गोजीपवेविसावयेदस्यक्॥

एरख् भूर्जपृतीक हिरद्राणान् वातजे। पत्रमाश्ववलं यच काश्मरी पत्रमेव च॥ पत्राणि चीरडचाणामीदकानि तथेव च। दूषिते रक्तपित्ताभ्यां ब्रणे ददाहिचचणः॥ पाठामूर्व्वागुङ्ग्वीनां काकमाचीहरिद्रयोः। पत्रच श्वकनाशाया योजयेत् कफजे व्रणे॥

For bile or blood-deranged wounds;—use leaves of Aśvabala (Basella Rubra), Kāśmarīpatra, (Gmelina Arborea), Vata (Ficus Bengalensis) and Kumuda (Nymphae Lotus).

For phlegm-deranged wounds—use leaves of Pāṭhā (Cisamphelos Hexandra), Mūrvā (Sansevieria Zeylanica), Guḍucī (Tinospora Cordifolia), Kākamācī (Solanum Nigrum), Haridrā (Curcuma Longa) and Śuknāśā (Oroxylum Indicum).

For similar purpose Caraka<sup>1</sup> recommends us to use the leaves of Kadamva (Anthocephalus Cadamba), Arjuna (Terminalia Arjuna), Nimva (Azadirachta Indica), Pātalī, Pippala (Ficus Religiosa) and Arka (Calotropis Gigantea).

The leaves of the padma or nymphæ are to be used for handling the eyeballs and the intestines, to replace them in their proper position when prolapsed by injury<sup>2</sup> (Suśruta) Caraka recommends lotus leaves and plantain leaves as coverings to the bleeding piles,<sup>3</sup> Cakradatta<sup>4</sup> mentions the use of

Suśruta Samhitā, IV. ii.

Caraka Samhitā, VI. ix.

गोजीशिफालिका प्रतेर्श्यः संलिख्यः लिपयेत्।
 चारिण वाक्शतः तिष्ठेदः यन्त्रदारं पिधाय च॥

Cakradatta, Arsa Cikitsā.

¹ कदम्बार्जीननिम्बानां पाटल्याः पिप्पलस्य च । त्रय प्राच्छादने विद्यान् पवाय्यकंस्य चादिशेत् ॥ Caraka Samhitā, VI. xiii.

भिन्नं नितमकर्ष्यस्थानमन्त्रं लम्बते तु यत्। तिन्नविश्य यथास्थानमन्त्राविङ्क्षिरं शनै:। पीङ्यित् पाणिना सन्यक् पद्मपतान्तरेण तु॥

कदलीदलेरभिनवै: पुष्तर प्रवेश शीतजलिसकौ:।
 प्रच्छादन सुइस्पुंड्रिं प्रशीत्पलदलेश ॥

Gojī and Šephālikā leaves for scratching the piles before the application of caustics to them. He also directs us to rub the small tumours with the rough leaves before the application of various ointments. Sivodāsa also mentions the use of such leaves for rubbing the eyelids in the pillva disease. Suśruta mentions the use of rough leaves for scratching any part.

Paul\* mentions the use of fig leaves, for rubbing down the hard granulations of granular lids.

#### 12. Young stems of plants.

The young shoots are described to have served the purpose of a probe. Caraka<sup>5</sup> calls them the soft variety, the metallic ones being called the hard probes. These shoots are to be used for superficial sinuses. Susruta directs us to use the young shoots

Cakradatta, Granthyarvuda Cikitsä.

वर्त्सावलेख' वहुशसदच्छोि (यतमी चयम् ।
 पुन: पुनविरेकञ्च पिलरोगातुरो भजेत् ॥

Cakradatta, Netraroga Cikitsā.

वर्त्वावलीखिमिति। कर्कश्रशाबीटकादि पढ्ढेण वर्त्मघर्षणम्।

Tattva Candrikā. Ibid.

चीमं प्लोतं पित्तं फीनं यावय्कं ससैन्थवं।
 कर्कशानि च पत्नाणि लेखनार्थे प्रदापंग्रेत्॥

Suśruta Samhitā, IV, i.

<sup>ि</sup> विष्टष्य ची डुम्बरशाकगीजी-पत्रेभृंशं चीद्रयुतै: प्रलिम्पेत्।

<sup>·</sup> Paul, II1. xxii.

See foot-note 4. P. 269.

of the pot-herbs called Cuñca and Upādikā (Basella Ruhra) as probes in sinuses on the eyelids and arround the anus.

If in young people the teeth become loose as the result of some injury, the patient should be directed to live upon milk only, sucking it through the stalk of lily; and thus affording the teeth rest and a chance of being firmly fixed again.<sup>2</sup>

To excite emesis, Sārngadhara, advises us to introduce a tube of Eranda (Ricinus Communis) into the throat of the patient. The vomiting is also said to have been excited by thursting a finger or a stalk of lily down the throat.

माड़ी व्रणान् श्रष्ट्यगर्भानुन्धार्ग्युत्सङ्गनः श्रनै:। करिरवालांगुलिभिरेषण्या वैषयिङ्गिषत्॥ नेचवर्त्वभुदाभ्यासनाद्योऽवज्ञाः श्रशोणिताः। चुञ्जपोदकजै: श्रन्णे: करीरैरेषयेऽत्तृताः॥

Suśruta Samhitā, IV. i.

सभग्नांस्रवितान्दन्तान् सरक्तानवपौड़येत्। तरुगस्य मनुष्यस्य श्रीतेरालेपयेद्वष्टिः॥ सिक्काम्बुभिस्ततः श्रितेः सन्धानीयेरुपाचरेत्। छत्पलस्य च नालेन चौरपानं विधीयते॥

Suśruta Samhitä, IV. iii.

क्रजीर्यं को ग्यपानीयं सिन्धु पीला वसेत् सुधो:। वसनं पायिवला च जानुसाचासने स्थितम्॥ कण्डमेरष्डनालिनं स्प्रश्नां वासयि इषक्। ललाटं वसतः पुंसः पार्श्वां हो च प्रवोधयेत्॥

Śārngadhara Samgraha, III. iii,

#### CHAPTER VIII.

# HYGIENIC APPLIANCES AND HOSPITAL REQUISITIES.

#### TOOTH-BRUSH.

The ancient Hindus used branches of trees as tooth-brush. They should have the length of twelve anguli and the circumference equal to that of the little finger. Susruta directs us to use a straight and plain branch of such trees as have an astringent, or sweet, or bitter, or sour taste<sup>1</sup>. Amongst these classes of trees, the twigs of Khadira (Acacia Catechu), Madhuka (Brassia Latifolia), Nimva (Melia Azadirachta), Karñja (Pongamia Glabra) are the best. The end of the stick is to be chewed first to form a brush and the teeth are then to be rubbed with it. He recommends us to use some tooth-powder.<sup>2</sup>

Suśruta Samhitā, IV. xxiv

चौद्र व्योष विवर्गातं सतैलं सैन्धवेन च। चूर्यन तेजोवत्याय दन्तावित्यं विश्रोधयेत्॥ एक्तैकं घर्षयेह्नां सदना कूर्यकेन च। दन्तसोधन चूर्येन दन्तमांसन्यवाधयन्॥

त्वादी दन्तपवन हादशाङ्गुल मायतं। किता परिणाह मृज्यपियतम्ब्रणं॥ अयुग्मयस्य यञ्चापि प्रत्यग्रं श्रःसभूमिजं। अवेन्यत्वेञ्च दोषञ्च रसं वीर्यञ्च योजयेत्॥ किषायं मधुरं तिक्तं कठुकं प्रात्तरित्यतं। निम्बय तिक्तके येष्ठः कषाये खदिरस्तथा। मधुको मधुरे श्रेष्ठः करञ्चः कटुके तथा॥

Bhāvamiśra mentions the names of other trees which may be used for the purpose, 1 and also gives us a list of trees to be avoided. 2 The use of the tooth-brush is contra-indicated in the various diseases of the mouth, ears, &c. 3 Caraka 4 advises us to use the tooth-brush twice a day.

भक्तें वीर्थं वटे दीति: करक्ते विजयो भवेत्।।
प्रत्ने चैवार्थसम्पत्तिवंदर्थां मधुरोध्वनि:।
खदिरे सुखसीगन्या विष्वेतु विपुलं धनम्॥
छदुन्बरे तु वाक्सिडिरानेत्वारोग्यमेव च।
कदम्बे तु धितमधा चन्पके च हृदामिति:॥
धिरीवे कीर्तिमीभाग्य मायुरारोग्यमेव च।
अपामार्गे धितमेधा प्रजाशिक्तस्थाध्वनि:॥
दाड़िन्यां सुन्दराकार: ककुभे कुटजे तथा।
जातीतगरमन्दारैदं:खप्रच विनश्यति।।

Bhāva Prakāśa, I. i.

गुवाकसालिहनाली केतकस ब्रहतृण। खर्जुरं नारिकेरस संग्रेते टणराजकाः॥ टणराज समुत्वन्नं यः कुर्याद दन्तधावनम्। नरसाखाल योनिः स्वादयावङ्गङ्गान्न पर्यति॥

Ibid.

अनखादिदगलतालीष्ट जिह्नारोग समुङ्गवे॥ अधास्यपान श्वासेच कासिहता वमीषु च। दुर्व्वलो जीर्ष भक्तश्व मूर्च्छानीमदपीष्ट्रित:॥ श्विरोक्गार्वस्तृष्ट्रित: श्वान्त: पानक्कमान्वित:। चहिंती कर्णग्रलीच दन्तरोगोच मानव:॥

Suśruta Samhitā, IV. xxiv

चापोथितागं द्वी काली कषायं कटुितक्कक्तम् ।
 भचयेङ्लपवनं दल्तमांसान्यवाधयन् ॥
 निम्हित्त गन्धवैरस्यं जिह्वादलास्यजं मलम् ।
 निष्कृष्य रुचिमाधत्ते सयो दलविशोधनम् ॥

Caraka Samhita, I. v.

Susruta mentions the use of a tooth-brush to extract a fish-bone from the throat.

After cleansing the mouth with water after meals, I'Tsing ordains<sup>2</sup> "Chew tooth-wood in the mouth; let the tongue as well as the teeth be carefully cleaned and purified." Again he says: "It is surely not seemly for any one to spend his time after meals chaffing and chattering, nor is it right to remain impure and guilty all day and night, without preparing water in a clean jar or without chewing a tooth-wood."

He continues<sup>3</sup>: "Every morning one must chew tooth-woods, and clean the teeth with them, and rub off the dirt of the tongue as carefully as possible. Only after the hands have been washed and the mouth cleansed is a man fit to make a salutation; if not, both the saluter and the saluted are at fault. Tooth-wood is Danta-kāṣṭha in Sanskrit—danta, tooth, and kāṣṭha, a piece of wood. It is made about twelve finger-breadths in length, and even the shortest is not less than eight finger-breadths long. Its size is like the little finger. Chew softly one of its ends, and clean the teeth with it. If one unavoidably come near a superior, while chewing the woods, one should cover the mouth with the left hand.

Then breaking the wood, and bending it, rub the tongue. In addition to the tooth-wood, some tooth-picks made of iron or copper may be used or a small stick of bamboo or wood, flat as the surface of the little finger and sharpened on one

<sup>&</sup>lt;sup>1</sup> सदुना वा दन्तधावनकुर्ववेनापहरेत्।

Suśruta Samhitā, I. xxvii.

<sup>2</sup> PTsing. Records of the Buddhist Religion. - Takakusu. P. 26-7.

<sup>3</sup> Ibid. ch. viii. Use of Tooth-woods, P. 33.

end, may be used for cleaning the teeth and tongue; one must be careful not to hurt the mouth. When used, the wood must be washed and thrown away.

Whenever a tooth-wood is destroyed, or water, or saliva is spit out, it should be done after having made three fillips with the fingers or after having coughed more than twice; if not, one is faulty in throwing it away. A stick taken out of a large piece of wood, or from a small stem of a tree or a branch of an elm, or a creeper, if in the forest; if in a field, of the paper mulberry, a peach, a sophora japonica (Huai), willow tree, or anything at disposal, must be prepared sufficiently beforehand. The freshly cut sticks (lit. wet ones) must be offered to others, while the dry ones are retained for one's own use.

The younger priest can chew as he likes, but the elders must have the stick hammered at one end and made soft; the best is one which is bitter, astringent or pungent in taste, or one which becomes like cotton when chewed. The rough root of the Northern Burr-weed (Hu Tai) is the most excellent; this is otherwise called Tsang-urh or Tsae-urh, and strikes the root about two inches in the ground. It hardens the teeth, scents the mouth, helps to digest food, or relieves heart-burning. If this kind of tooth-cleaner be used, the smell of the mouth will go off after a fortnight. A disease in the canine teeth or toothache will be cured after a month. Be careful to chew fully and polish the teeth cleanly, and to let all the mouth-water come out; and then to rinse abundantly with water. That is the way. Take in the water from the nose once. This is the means of securing a long life adopted by Bodhisattva Nagarguna. If this be too hard to put in practice, to drink water is

also good. When a man gets used to these practices he is less attacked by sickness. The dirt at the roots of the teeth hardened by time must all be cleaned away. Washed with warm water, the teeth will be freed from the dirt for the whole of life. Tooth-ache is very rare in India owing to their chewing the tooth-wood."

#### Тоотн-Ріск.

Susruta advises us to use sticks of grass as tooth-pick after meals to extract particles of food lodged between the teeth, otherwise these will decompose and the mouth would be smelling badly. Bhāvamiśra gives similar directions but adds that if any particles of food cannot be easily extracted by the tooth-pick, one must not use any force to extract them. "After eating they cleanse their teeth with a wilow stick, and wash their hands and mouth."

JIHVA NIRLEKHANA OR TONGUE SCRAPER.

Suśruta says: "To scrape the tongue, a golden, or silver, or

Suśruta Samhitā, I. xlvi.

एवं भूक्वा ममाचामिद्रूचग्रहण पूर्वकम् । भीजने दललग्रानि निर्ह्वत्याचमनं चरेत् ॥ दलान्तरगतं चात्रं शोधनेनाहरेत् शनैः। कुर्धादिनिर्ह्वतं तिह्व सुखस्यानिष्ट गन्यताम् ॥ दललग्रमनिर्हायं सिपं मन्येत दल्तवत् न न तत्र वहुशः कुर्याद यवं निर्हरणं प्रति ॥

Bhava Prakasa, I. i.

दिनान्तरगतं चाद्गं शोधनेनाष्ट्ररेक्क्नैः। कुर्थादनाष्ट्रतं तिज्ञ सुखस्यानिष्टगस्यतां॥

<sup>&</sup>lt;sup>3</sup> Beal's Records of the Buddhist Religion. Trans. from Hiuen Tsiang, vol. l, p. 77.

wooden scraper is to be used. It should be ten anguli long and must be pliant and polished". Caraka<sup>2</sup> mentions tongue-scraper of copper, lead or brass. Bhāvamisra<sup>3</sup> also gives a similar discription. It is to be used for scraping the deposit on the tongue. It is still commonly used in India.

RAZOR AND SHEARS. THE PRACTICE OF SHAVING.

Every one is recommended by Susruta to have his heard shaved, hair trimmed and nails pared. 4 Caraka<sup>5</sup> also advises

जिह्वानिर्लेखनं रीम्यं सीवर्णं वार्चमेव च। तन्मलापहरं शस्तं सट्याल्यं दशाङ्गनं॥

Suśruta Samhitä, IV. xxiv.

सुवर्षकृष्यताश्वाणि तपुरीतिमयानि च। जिह्वानिर्लेखनानि खुरतीच्यान्यटजूनि च॥ जिह्वाम्लगतं यच मलसुच्छ्वासरीधि च। सीगस्या भजते तेन तस्याज्जिह्वां विनिर्सिखत॥

Caraka Samhitü, I. v.

जिह्वानिर्खेखनं ईंभं राजतं तासजं सथा॥ पाटितं चटु तत् काष्ठं चटुपत्रमयं तथा। "तत्काष्ठं" दल्लशोधनयोग्यं काष्ठम्। दशाङ्गुलं चटु स्निग्धं तेन जिह्वां लिखेत् सुखम्। तिज्जह्वा मलवेरस्य दुर्गन्य जड़ता हरम्॥

Bhāva Prakāša, I. i.

पापीपश्मनं, केशनखरीमापमार्ज्जनं ॥ हर्षेलाघव-सीभाग्य-करसुत्साह वर्द्धनं । वागवारं सजावर्षं तेजीवल विवर्क्षनं ॥

Suśruta Sambitā, IV. xxiv.

तवादित एव नीचनखरीचा \*

Ibid.

पौष्टिकं ब्रष्यमायुष्यं ग्रचिक्पविराजनम्।
 केशश्मगुनखादीनां कल्पनं संप्रसाधनम्॥

Caraka Samhitā, I. v.

us to shave regularly, that is thrice in a fortnight. Bhāvamiśra says that this practice conduces to health, beauty, longevity and purity, and should be observed every fifth day<sup>2</sup>. Razor is mentioned in the Rgveda<sup>3</sup> and in the Kathopanisad of the White Yayu. In the Satapatha Brāhmaṇa, we find the method of shaving well described. "Then (in shaving) are used a porcupine quill spotted in three places and a copper razor; that three-spotted porcupine's quill resembles the three-fold science and the copper razor resembles the Brāhmaṇa; for Brahmā is fire, and fire is of reddish (lohita) colour, hence a copper (loha), razor is used".

Again we read<sup>6</sup>:—"For impure, indeed, is that part of man where water does not reach him. Now at the hair and beard, and at the nails the water does not reach him; hence when he shaves his hair and beard, and cuts his nails, he does so in order that he may be consecrated after becoming pure.

Carakas Samhitā, I. viii.

Bhāva Prakāśa, I. i.

¹ ति: पचस्य केश्यमगुलीमनखान् संहारयेत्।

पश्चरावात्रख प्रस्युकेशरीमाणि कर्भयेत्। केश्यस्य नखादीनां कर्भनं सम्प्रसाधनम्। पौष्टिकं धन्यमायुष्यं शीचकान्तिकरं परम्॥ ''सम्प्रसाधनम्'' शोभाजनकम्॥

उ सं न: शिशीहि भुरिजीरिव चुरंराखराथी विमीचढ। Regreda, 8 M. 4 S, 5 A. 7 A. 16 V.

<sup>\*</sup> चूरस्य धारा निश्चिता दुरत्यय दुर्गम्पयस्तत् कवयो वदन्ति । Kathopanişad, I. iii.

Satapatha Brāhmana, II. 6. 4. 5.

<sup>6</sup> Ibid, 111, 1.2.2.

- 3. Now some shave the selves all over, in order that they may be consecrated after becoming pure all over; but let him not do this. For even by shaving the hair of his head and his beard, and by cutting his nails he becomes pure; let him therefore shave only the hair of his head and his beard, and cut his nails.
- 4. In the first place he outs his nails, first of the right hand, for in human (practice) those of the left hand (are cut) first, but with the gods in this manner. First he cuts those of the thumb—for in human practice those of the little fingers are cut first, but with the gods in this manner.
- 5. He first passes (the comb) through his right whisker—for in human (practice they comb) first the left whisker, but with the gods in this manner.
  - 6. His right whisker he moistens first with the text "may this divine water be propitious unto me".......
  - There upon be lays a stalk of sacrificial grass on (the hair of the whisker) with the text "O plant, protect me".......Thereto he applies the razor, with the text "O knife, injure him not".
- 8. Having cut off (part of the stalk and hair), he throws it into the vessel of water. Silently he moistens the left whisker; silently he lays the stalk of grass on it; and having silently applied the razor thereto and cut through (it and the hair) he throws them into the vessel of water.

He then hands the razor to the barber, and the latter shaves off the hair and beard. When he has shaved the hair and beard......

10. He bathes.....

- 12. He steps out (from tha water) towards the north-east, with the text "cleansed and pure I go forth from them;".......
  - 13. He then puts on (a linen) garment etc."

"The Atharva-veda relates how, when the ceremony of shaving off his beard was performed on king Soma, Váyu brought the hot water and Savitrī skillfully wielded the razor."

In para. 3, quoted above, we have evidence of the practice of depilation of the pubes which is here forbidden. There are six imortant rules and six minor rules of ordination for the female members or Sramaneris of the Buddhist order. One of the six minor rules is: A female must not shave the hair in any place but the head.<sup>2</sup> "Aristphanes, a contemporary of Hippocrates,<sup>3</sup> Persius<sup>4</sup> and Juvenal<sup>5</sup> refers to the depilation of the pubes as being common among certain classes, and the early Christian Fathers deplore the practice. See also the remarks of Seutonius on the conduct of Domitan" Prosper Alpinus (16th century) "found the custom still prevalent among the Egyptian women". "The custom survived in France, and Italy in the 16th century".

## KEŚA PRASADHANI OR COMB.

Susruta directs us to comb the hair to free the head from dust,

Maedonnel's Sanskrit Literature, p. 164.

<sup>\*</sup> See l'Tsing, P. 97, Foot-note 3. Vinaya Samgraha. Chap. xii.

<sup>&</sup>lt;sup>a</sup> Hippocrates, Ran. 516, Lys 89, 151.

<sup>·</sup> Persius, iv. 37.

<sup>5</sup> Juvenal, vii. 114.

<sup>·</sup> Sentonius, xxii.

<sup>&</sup>lt;sup>7</sup> Medicina Acgyptiorum, 111. xv.

Milne, Surgical Instruments &c., p. 90-91.

louse and dandruff.¹ Bhāvamiśra advises us to comb the hair every day to keep it clean, as it stimulates the growth of hair.² Caraka³ also recommends us to keep the hairs clean. The practice of combing the hair is very ancient; the Atharva-veda mentions a comb with a hundred teeth.

#### LOOKING-GLASS.

The looking-glass should be constantly used as thereby the complexion is said to be improved and life prolonged. For an account of the looking-glass of the ancient Hindus, see Mitra's Indo-Aryans<sup>5</sup>.

#### DRESS.

Silk, chintz and red clothes are good for the winter, for they are said to be useful for derangement of air and phlegm. Thin silk is cooling and is efficacious for biliary disorders; so it should be used during the summer. It should be coloured twany or red. White clothes are auspicious and are neither hot

Suśruttā Samhitā, IV. xxiv.

केश्यपाग्री प्रकुर्व्वीत प्रसाधन्या प्रसाधनम् ।
 केश्य प्रसाधनं केश्य रजीजन्तु सलापहम् ॥

Bhāva Prakāśa, I. i.

<sup>8</sup> साध्वेश: प्रसाधितवेशो \* \*

Caraka Samhitā, I. viii.

श्रादर्शालीकनं प्रोक्तं नाङ्गल्यं कान्तिकारकम् ।
 पौष्टिकं वल्यमायुष्यं पापलक्षी विनाशनम् ॥

Bhāva Prakāśa, I. i.

<sup>&</sup>lt;sup>1</sup> केश्प्रसाधनी केश्या रजीजन्तु मलापहा।

<sup>5</sup> The Indo-Aryans Vol. 1, p. 240,

nor cold; therefore they should be worn during the rains<sup>1</sup>. Caraka says that pure dress conduces to longevity, happiness and fortune<sup>2</sup>.

# Ușnīsa or head dress.

Susruta<sup>3</sup> advises us to use a cap on our head which is thus protected from injury. Bhāvamiśra says that the habitual use of some form of covering for the head stimulates the growth of hair, increases beauty of the head and protects it from dust, draughts and accumulation of phlegm. Only light caps should be used as the heavy varieties derange bile and cause diseases of the eyes.<sup>4</sup> For the diagrams of the various forms of turbans used by the ancient Hindus, see Mitra's Indo-Aryans.<sup>5</sup>

े को ग्रेगी िर्णक वस्त्रच रक्तवस्त्र त्येव च। वातक्षेत्र इरन्त् ग्रीतकाले विधारयेत्॥ "को ग्रेगे" पद्मावरं वस्त्र वस्त्र त्यः। मध्यं सुग्रीतिष्य त्तं क्षायं वस्त्र सुच्यते। तद्धारयेट्यूकाले तत्रापि लघु शस्यते॥ कषायद्वीकटी इति लोके, कषाय रागरक्तं वा। ग्रक्तन्तु ग्रमटं वस्त्रं ग्रीतातप निवारणम्। नची श्रम् चवां ग्रीतन्तु वर्षासु धारयेत्॥

Bhāva Prakāša, I. i.

कार्य यशस्त्रमायुष्यमलक्षीप्त प्रहर्षणम् ।
 श्रीमत् पारिषदं शक्तं निर्मालान्वरधारणम्

Caraka Samhitā, I. v. Bhāva Prakāša, I. i.

- पवित्र केशसुर्खीषं वातातपरजीऽपद्यं। Sufrata Samhitā, IV. xxiv.
- उच्चीवं क्रांनिकत्विय्यं रजीवात कपापद्वम् ।
   लघु तच्हस्थने यसाद गुरु पिताविरोगक्कत्॥

Bhava Prakasa, I. i.

The Indo-Aryans, Vol. 1, p. 220.

# CHATRA OR UMBRELLAS.

Suśruta says: Umbrellas are useful for protecting men from the rains, draughts, glare of the sun, exposure to cold, and dust. They are auspicious and are beneficial to the eyes<sup>1</sup>. Caraka<sup>2</sup> advises us to use it as it protects us from the sun, rain &c. Bhāvamiśra<sup>3</sup> also describes its efficacy similarly. Umbrella is one of the insignia of royalty in India, and is always held over the heads of kings as shown in the Sanchi and Amarāvatī sculptures<sup>4</sup>. It is still commonly used in India.

## YASTI OR STICKS.

Caraka<sup>5</sup> directs us to use a stick as a support. Suśruta says: "By using sticks, a man gains in strength, prowess and manliness. He becomes courageous, patient and forbearing. He can stand erect and is not troubled by any fear<sup>2,6</sup>. It

Suśruta Samhitā, IV. xxiv.

 ईतिर्विधमनं वत्यं गुप्तप्रावरणशङ्करम् । घर्मानिलरजोऽम्बुन्नं क्ष्मधारणसुचिते ॥

Caraka Samhitā, I. v.

े क्वस्थ धारणं वर्षातपवात रजोऽपद्वम् । हिमन्नं हितमक्षीयं माङ्गव्यमपि नौर्तितम॥

Bhāva Prakasa, I. i.

ख्वलतः संप्रतिष्ठानं सत्याच निस्दनं।
 च्वष्ठक्षनमायुष्यं भयज्ञं द्र्यार्यम्॥

Caraka Samhita, I. v.

धनः सरौद्धपत्याल विषाणिभ्योभयापहं ।
 त्रमच्छलन दोषञ्चं स्थिविरेच प्रशस्ति ॥
 सत्तोत्साहबलस्थैर्यः षैर्य्यवीर्यः विवर्षनम् ।
 सवद्यभकरसापि भयद्यं दर्द्धधारणं ॥

Susruta Samhitā, IV. xxiv.

वर्षानिलरजोधर्मः हिमादीनां निवारणं। वस्य चन्नस्य मौजस्यं श्रङ्करं क्रमधारणं॥

<sup>\*</sup> See Indo-Aryans, 1, p. 266.

protects a man from dogs, snakes &c. Bhāvamiśra¹ apparently quotes these verses from Suśruta.

#### UPANAHA OR SHOES.

The ancient Hindus used two kinds of shoes, made of wood and leather. The wooden pādukā is recommended to be used before and after dinner<sup>2</sup>. The good effects claimed by its use are, an increase of the power of vision, strength and longevity.<sup>3</sup> When travelling, the upānaha or leather shoes are to be used. Besides the advantages mentioned above, shoes are very comfortable to the travellers and prevent many diseases of the feet<sup>4</sup>. If any one often travels barefooted, he feels out of sort, his senses fail, vision becomes impaired and his expectation of life is reduced.<sup>5</sup>

Bhāva Prakāśa, I. i.

चत्रुष्यं स्पर्धनिहतं पादयोर्व्यसनापञ्चम् ।
 बल्यं पराक्रमसुखं ध्रष्यं पादचधारणम् ॥

Caraka Samhitā, I. v.

पाटरीगहरं वृष्यं रचीम्नं प्रीतिवर्धनं । सुखप्रचारमीजस्यं सदापादतथारणं । भनारीग्यं मनायुष्यं चच्चुषीरूपवातकृत् । पादाभ्यामनुपानद्वाां सदा चंक्रमणं नृषां ॥

Suśruta Samhitā, IV. xxiv.

उपानद्वारणं नेत्रामायुष्यं पादरीगहत्।
 सुखप्रचारनोजस्यं वृष्यच पित्कीर्त्तितम्॥
 पादाभ्यामनुपानद्वाां सदा चंक्रमणं नृषाम्।
 श्वनारोग्य मनायुष्यमिन्द्रियन्न मदृष्टिदम्॥

Bhāva Prakāfa, I.i.

<sup>1</sup> Bhava Prakasa, I. i.

पादकारोहणडुर्व्यात् पूर्वे भीजनतः परम्। पादरोग हरं हथा चन्नुष्यचानुषी हितम्॥

The Hindus wore sandals like the ancient Greeks. They also used boots, which look like the modern boots used by Europeans. Buddha gave the Bhikkhus permission to wear boots or shoes, with thick lining1. Hiuen Tsiang2 says that here (Avantī) Tathagatha gave permission to the Bhikkhus to wear kih-fu-to (boots)." For an account and figures of ancient boots used by the Hindus, see Indo-Aryans.3

# VYAJANI AND CAMARA. THE FAN.

The fan was used for airing the patients to drive away flies.4 Susruta mentions the camara i.e., the tail of the Thibetan yolk (Bos grunnius) to be used as a fan. "It soothes the inflammation of boils and also acts as a fly-brush to prevent infection of the open wound"5. The camara is also one of the · insignia of royalty and as such we have many representations of it in the sculptures of ancient Iudia<sup>6</sup>. For diagrams of the ancient fan, see Indo-Aryans 7.

· Caraka directs us to use a kulā or fan to winnow corn, prepared from the kasa (Saccharum Spontamum) to resuscitate a still-born child8.

Caraka Sambitā, IV. viii.

<sup>&</sup>lt;sup>1</sup> Mohāvagga, varga 13 ff 6. S. B. E. vol. xvii. p. 35.

Beal's Records. of Buddhist Religion, vel. II. p. 280.

<sup>&</sup>lt;sup>3</sup> Inde-Aryans, Vol. 1, p. 123-6.

वालव्यजन मौजस्य् मिचकादीनपोद्दित । शोषदाह श्रमस्वेद मुच्छान्नी व्यननानिल:॥

Suśruta Samhita, IV. xxiv.

व्यज्येत वालत्यजनैर्द्रेण नच विघट्टयेत्।

<sup>•</sup> See Indo-Aryans, vol. II, p. 267-70. Ibid, I. xix.

<sup>&</sup>lt;sup>7</sup> For diagrams, see Indo-Aryans, vol. I, p. 263.

<sup>&</sup>lt;sup>8</sup> तथा संक्षेत्रविहतान प्राणान् पुनर्दभित क्षण्यक्यां तिकार्य्ण चैनमि: निधुनीयाद-विषेष्टं सात् यावत् प्राचानां प्रवागमनं तत्तत्सर्व्वमेवकुर्यः॥

Bhavamisra mentions fans made of the following materials:—
palm leaf; bamboo, yolk's tail, cloth, peacock's feather and cane.

He attributes peculiar properties to each fan.

Rajavallabha says<sup>2</sup> that "the palm-leaf fan overcomes disturhances of all the three humours, and is light and agreeable; the phamboo fan causes heat and irritablity, and promotes inordinate secretion of the two humours—air and bile; the cane, cloth and poacock's feather fans, overcome disturbances of the three humours; the hair fan is invigorating etc."

The Buddhist Baiksus used the palm-leaf fap. "Not unfrequently there is added a lotus-leaf shaped fan, made from a single frond, with an edging of bamboo or light wood, and furnished with a bundle fashioned like the letter "S". The palm from which the leaf is taken, is also that used for the mss., namely the Talipot; hence the name Talponi given to the Bhikkhus by the early Portuguese adventurers in Burma. When he attended a meeting at which women are likely to be present, every Bhikkhu must have the fan."

Bhāva Prakāśa, I. i.

म्यजनस्यानिसी दाह स्वेदमुच्छा यसापहः।
तालहरूमभे वातस्विदीषयमकी मतः॥
वंशस्यजनजस्तृषी रक्तपित्तप्रकीपणः।
चामरी वस्त्रसभूती माधूरी वेतजस्तया॥
एन दोषजिता वाताः स्विग्धा द्वयाः सपूजिताः।

तानस्यजनगुष:—ितदोषशमनलम्। लघलञ्च॥ वंशस्यजनगुण:—ित्रस्यलम्।
 धन्यतम्। वागुपित्तकारित्वञ्च॥ वेतवस्त्रमधूरपुन्कस्यजनगुण:—िनदोषनाशितम्।
 वानस्यजनगुण:—तनस्वत्तम्। मिलकादि निवारकतञ्च।

Rāja vallabha.

<sup>\*</sup> The Way of Buddha, p. 53-54.

### FILTERS.

Filters were used by the Hindus and are recommended to be made of an earthen or metallic vessel, the mouth being closed by a piece of cloth tied round its neck.

If the water be filthy, Suśruta¹ advises us to purify it by boiling it or by exposure to the sun; or by throwing hot iron balls, sand or clay balls into the water and then allowing it to cool. Such purified water should be scented with the flowers of Nāgakeśara (Mesua Ferrea), Campaka (Michelia Champaca), Utpala (Nymphæa Stellata) and Patala (Bignonia Snaveolens).

Suśruta mentions seven means of purifying polluted water<sup>2</sup>, viz.,

- 1. Kataka phala or nirmālaya or seeds of Strychnos Potatorum.
  - 2. Gomedaka or a kind of gems.
  - 3. Visagranthi, or root of Nelumbium Speciosum.
  - 4. Saivālamūla or root of Vallisneria Spiralis.
  - 5. A piece of cloth.
  - 6. Pearls.
  - 7. Precious Stones and crystals.

Suśruta Samhitā, I. xlv.

<sup>2</sup> तत्र सप्तकलुषस्य प्रसाधनानि भवनि । तदाया । कतकगीभेदकविषग्रन्थिशैवालसूल-वस्त्राचि सुक्तामणिश्रेति । पञ्चनिचेपणानिभवन्ति । तदाया । फलकं त्राष्टकं सुञ्चवलय उदकमश्विकाशिकाञ्चेति । सप्तशीतिकरणानि भवन्ति । प्रवातस्थापनसुद्वाप्रचेपणं यप्टिका-क्षामचं व्यजनं वस्त्रोद्धरणं वालुका प्रचेपणं शिक्यावलस्वनञ्जेति ।

² व्यापन्नानामप्रिक्तथनं क्येंवातपप्रतापनं तप्तायः पिण्डिसिकताली द्राणां वा निर्व्वापनं प्रसादनञ्च कर्त्ते यं नागनम्पकी त्पलपाटलापुष्पप्रस्रतिभिञ्चाधिवासनिमिति।

He mentions five kinds of means for preventing contact of the water vessel with the earth 1:—

- 1. Phalaka or planks as of Salmali wood.
- 2. Tryastaka or octogonal tripod of wood.
- 3. Muñjvalaya or circular pad of Saccharine Muñja.
- 4. Udakamañcikā or a raised framework of cane and hamboo.
  - 5. Sikya or a loop suspended by three strings.

He mentions seven ways of cooling water :-

- 1. Exposure to air.
- 2. Sprinkling water on the vessel.
- 3. Stirring the water with a rod.
- 4. Fanning the water.
- 5. Filtration through cotton fabrics.
- 6. Putting the vessel of water on a sand bed.
- 7. Suspension of the vessel in a loop.

He advises us to use rain water filtered through a broad piece of white and clean cloth<sup>2</sup>. In collecting water from the rivers and ponds, the Hindu females still use a kalasī or earthen vessel, the mouth being closed by a piece of cloth.

In the English translations of the Susruta Samhita, Bibliotheca Indica, Dr. Cattopadhaya translates the passage incorrectly. He misunderstood the terms phalaka, &c. to be remedial agents, necessary in the prorification of water.

शाङ्गं पुन: प्रधानं तटुपाट्टीताश्वयुज्ञे मासि ग्रुचिग्रक्रवित तपटैकदेशच्युतमथ वा इस्प्रातलपरिसप्टमन्यैळी ग्रुचिमिर्माजनैग्र्यं होतं।

Susruta<sup>1</sup> deprecates impure water as injurious to the human system and advises us not to drink or bathe in such water as there is always the risk of being speedly affected with many diseases.

"It (filter) forms one of the eight sacred utensils necessary for a sramana of the Buddhist order. It is a strainer or water-dipper an appratus for filtering the water which he drinks, so that he may not, even unwillingly, take animal life"2

One of the six requisites of a Bhiksu is Parisravana, a water-strainer<sup>3</sup>.

#### WATER VESSEL.

To store water, Susruta mentions vessels of gold, or silver, or earth 4.

"The clean water is kept separately from water for cleansing purposes (lit. 'touched' water), and there are two kinds of jars (i.e. kundi and kalasa) for each. Earthenware or porcelain is used for the clean jar, and the jar, for water for cleansing purposes (lit. touched water) is made of copper or iron. The clean water is ready for drinking at any time, and the 'touched' water for cleansing purposes after having been to the urinal.

व्याप्रतं वर्जयेतित्वं तीयं यहाप्यनार्तवं । दोषसञ्चननं च्चे तत्राददीताहितन्तु तत् ॥ व्यापत्रं सिवलं यस्तु पिवतीहा प्रसाधितं । स्वययुं पाष्डुरोगञ्च त्वग्दोषमितपाक्षतां ॥ स्वासकासप्रतिस्थायस्त्वगुल्सोदरानि च । स्वस्थान् वा विषसान् रोगान् प्राप्न्यात् चिप्रमीवच ॥

Suśruta Samhita, I. xlv.

<sup>&</sup>lt;sup>2</sup> The way of Buddha, p. 53. <sup>3</sup> I'Tsing, ch. x.

<sup>\*</sup> सौवर्षे राजने सन्मये वा पाते निद्ध्यात् तत्सार्व्यकालस्पयुञ्जीत तस्यालामे भीमम्।
Thia

The clean jar must be carried in a clean hand, and be placed in a clean place, while the jar for the 'touched' water should be grasped by the 'touched' (or 'unclean') hand and be put in an unclean (or 'touched') place. The water in a pure and fresh jar can be drunk at anytime; the water in any other jar is called 'special water' (more lit. seasonable water i.e. water to be used at certain prescribed times, probably kâlodaka)."

#### BATHING.

The Hindus in their daily life do not eat without having first washed themselves in a bath. They always use a bathing-sheet and this ancient practice is still followed.

Bhāvamiśra says<sup>2</sup>: "Bathing stimulates the appetite, virile power and strength, prolongs life, allays thirst and burning sensation, cures eczema, and washes out dirt and perspiration:" •

Besides the ordinary bath, there is some evidence of the use of a medical bath to cure diseases. I'Tsing says<sup>3</sup>: "The World-honoured One taught how to build a bath room, to construct a brick pond in an open place, and to make a medical bath in order to cure a disease. Sometimes he ordained the

<sup>&</sup>lt;sup>1</sup> I'Tsing, ch. vi.

दीपनं हष्यमायुष्यं सान मोजो वलप्रदं। कष्डुमलग्रमःस्वेदतन्द्रा टङ्दाइ पापनृत्॥ बाह्यस्य सेके: शीतायौ रूपान्तर्गाति पीम्डितः। नरस्य सातमात्रस्य दीष्यते तेन पावकः॥ शीतेन पयसा सातं रक्तपित्तप्रशान्तिक्तत्। तदेवीणीन तीयेन वल्यं वातकपापहम्॥ श्रिर: सानमचन्नुष्य मत्युणीनास्तुना सदा। वातस्येष प्रकोपितु हितन्त्वस्य प्रकीतिंतम्॥

Bhāva Prakāśa, I. i.

whole body to be anonited with oil, sometimes the feet to I rubbed with oil every night, or the head every morning; for such a practice is very good for maintaining clear eyesight an keeping off the cold." "Bathing should always take place when one is hungry. Two kinds of benefits are derived I having meals after bathing. First, the body is pure and empty being free from all dirt, second, the food will be well digest as the bathing makes one free from phlegm or any disease of ti internal organs. Bathing after a good meal is forbidden in ti 'Science of Medicine'" (Kikitsā-Vidyā).

#### DRINKING VESSEL.

Scented water is advised to be drunk out of cups made gold, or silver, or copper, or bell-metal, or lapis lazuli or eart Bhāvamiśra<sup>2</sup> also mentions cups of the same materials.

"To drink from a jar holding it upright in front is no faul, but drinking in the afternoon is not permissible. A jar mu, be made to fit one's mouth; the top of the cover should two fingers high; in it a hole as small as a copper chopstic made.

Fresh water for drinking must be kept in such a jar. the side of the jar there is another round hole as large small coin, two fingers higher than the drinking-mouth. hole is used for pouring in water; two or three gallons may put in it. A small jar is never used.

See foot-note 2, P. 65.

जलपातन्तु तासस्य तदभावे स्टदीहितम्। पवितं शीतलं पात्रं गठितं स्कटिकेन यत्॥ काचेन रचितन्तइत्तथा वेट्ट्यं सम्भवस्।

If one fear that insects or dust may enter in, both the outh and the hole may be covered by means of bamboo, wood, inen, or leaves. There are some Indian priests who make jars according to this style. In taking water the inside of the jar must be first washed in order to get off any dirt or dust, and then fresh water must be poured in.

A priest who travels, carries his jars, bowl, necessary clothes, by hanging them from shoulders over his cloak, taking an imbrella in his hand. This is the manner of the Buddhist priests in travelling<sup>1</sup>."

#### DINNER SERVICE.

Susruta<sup>2</sup> advises us to use different kinds of vessels for distributing the various kinds of food:—

Iron vessels for ghee or clarified butter.

Silver vessels for drinks, soups and gruels.

- <sup>1</sup> I'Tsing, ch. vi.
- श्रेतं कार्णाग्यसे देयं पेया देयातु राजते ॥

  फलानि सर्व्यभत्यां य प्रद्याहैदलेषु च ।

  परिग्रष्कप्रदिग्धानि सीवर्णेषु प्रकल्पयेत् ॥

  प्रद्रवाणि रसां वैव राजतेषूपहारयेत् ।

  कट्टराणि खडां वैव सर्व्यान् प्रेलेषु दापयेत् ॥

  द्यात्तासमये पाचे सुग्रीतं सुग्रतं पयः ।

  पानीयं पानकं मर्यं स्वत्ययेषु प्रदापयेत् ॥

  काचस्रिटिकपातेषु शीतलेषु ग्रमेषु च ।

  द्याहैद्र्येपातेषु रागषाडवसहकान् ॥

  पुरस्ताहिमले पाते सुविस्तीर्यं मनोरमे ।

  सूदः सुगीदनं ददात् प्रदेहां य सुसंस्कृतान् ॥

Suśruta Samhitā, I. zlvi.

Plantain leaf vessels for fruits and sweetmeats.

Göld vessels for flesh.

Stone vessels for whey.

Copper vessels for milk.

Earthen vessels for water, sherbets and wines.

Glass, crystal, lapis lazuli vessels for rājsādava and sattaka.

In the Bhāva Prakāśa¹ we have a detailed description on the subject-"A dinner service of gold is the best from a medicinal point of view, and it is supposed to be the best tonic for the eye. Eating out of silver is equally efficacious for promoting hepatic functions. A service of zinc improves the intelligence and · appetite. Food served in brass utensils promotes wind and heat, but cures phlegmatic disorders and expells worms. The use of steel or glass vessel cures chlorosis, jaundice and intumescence. A stone or clay service brings on poverty. Wooden plates are good appetisers, but help the secretions of phlegmatic The use of certain leaves as plates acts as an antidote humour. against poisons. When at dinner, a water jug with a cup should be placed on the right hand. A copper vessel is the best for the The next best is an earthen pot. Vessels made of purpose. crystal and lapis lazuli are also pure and cooling".2

Bhava Prakāśa, I.i.

आयसे काचपाते च भोजनं सिखिकारकम्। शोय पाष्डुहरं वल्यं कामलापहसुत्तमम्। शेलीये खलाये पाते भोजनं श्रीनिवारणम्। दारुद्ववे विशिषेण रुचिदंश्चेषाकारितु। पातं पतमयं रुचां दीपनं विषपापनृत्॥

<sup>&</sup>lt;sup>2</sup> History of Aryan Medical Science, p. 64-5.

#### SPOONS.

I'Tsing says 1: "As to the mode of eating in the West, they use only the right hand, but if one has had an illness or has some other reason, one is permitted to keep a spoon for use."

#### SPITTOONS.

Spittoons were commonly used by the ancient Hindus, and Caraka<sup>2</sup> mentions it as one of the things necessary for the sick room. It is also mentioned in the Mohāvagga<sup>3</sup>: "And the sethe's wife spat it out into the spittoon." Fa-Hian<sup>4</sup> noticed a "stone spitting vessel in this country (Kie-sha) belonging to Buddha."

#### BEDPANS AND URINALS.

The bedpan and urinal were also used by the patients in ancient times. Caraka metions them to be necessary in a sick room.

#### PUS BASINS.

Metallic basins marked with different measures were used for holding discharges after operations. In the Aśvavaidyaka<sup>6</sup>

<sup>2</sup> चोपन्यस्तभाङ्गार प्रतिग्रह्माणि।

# प्रतिग्रहां यीपचारयेत्॥

Caraka Samhitā, I. xv.

- 3 Sacred Books of the East. VIII. i. ll.
- \* Beal's Records, vol. l. Introduction, xxviii.
- <sup>5</sup> See Page 36 and foot-note I, P. 34.
  - प्रदेश लोमश्रे नित्यं लोमान्युतपाद्य वैधयेत्।
     प्रमाशार्थश्व पातेण रक्तं रङ्गति वृद्धिमान्॥

Aśvavaidyaka, XV. verse 30.

<sup>&</sup>lt;sup>1</sup> I'Tsing. ch. xvi.

blood let out in the operation of phlebotomy, is recommended to be collected in a basin, so that the quantity may at once be determined.

#### PESTLE AND MORTAR.

Pestle and mortar are mentioned in the Rgveda for preparing the Soma juice. And their use in pharmacy was well-known to the ancients.

Besides the pestle and mortar of pharmacy, we find mention of a large wooden pestle used in reducing dislocation by Suśruta.<sup>2</sup> Caraka says that two pestles and motars should be kept in a lying-in-room, the object being to allow the woman some kind of work; and then she will not lie down idly on her bed if there be any delay in the delivery of the child<sup>3</sup>. Suśruta also recommends it<sup>4</sup>. "The mortar (ulukhala) and pestle (muṣala) are to be made of very hard wood, viz., both of Varana wood (Crataiga Roxburghii), or the mortar of Palāśa wood (Butea Frondosa), and the pestle of Khadira wood (Acacia Catechu). The former

• यचिह्नि लंग्टहेग्टह उनूखनक युज्यसे।

Rgveda, 1 M. 28 S. 1 &. 2 R.

सा चेदावीभि: संक्षिग्धमाना न प्रजायिताधेनां ब्रूयात् उत्तिष्ठमूषलमन्यतरञ्ज ग्रङ्गीव्यनिनेतदु-द्खलं धान्यपूर्णं महुर्माहुरधिजिहि सुहुर्माहुरवजृत्मस्य चंक्रमस्य चान्तरान्तरा इत्येवसुपदिग्रन्यके । Caraka Samhitā, IV. viii.

¹ उनूखनमुतानामवेिदंद्र जल्गुन: ॥

<sup>\* \* \* \*</sup> 

<sup>&</sup>lt;sup>2</sup> See foot-note 6, P. 172.

<sup>&</sup>lt;sup>3</sup> See P. 39, and foot-note 1, P. 40.

कालातीतस्थायिनि गमे विशेषतः सधान्यसुद्खलंभूषलेनाभिष्ठन्यादिषमे वा यानासने सेवेत ।

Suśruta Samhitā, III. x.

is to be of the height of the knee and the latter three aratnis (cubits) long1."

On the inner face of the left pillar in the eastern gate of Sanchi Tope, there is a beautiful representation of a kitchen scene, in which the ancient mortar and pestle are shown. "The mortar and two-handed pestle same as those in use at the present day in India. The mortar (okhli) is exactly the same as the Greek  $\ell\gamma\delta\eta$ , and the Roman pila; and the pestle (musar) is the same as the Greek  $K\delta\pi\alpha\nu\sigma\nu$ , and the Roman pilum"<sup>2</sup>

The pestle and mortar used in pharmacy was called asmabhālam. It is still used to pulverise medicaments, and i made of iron or brass.

In the Mahāvagga<sup>8</sup> we find a reference to the pestl and mortar. "I allow, O Bhikkhus, the use of a chunam a a medicine by whomsoever has the itch, or boils, or a discharg or scabs, or whose body is ill smelling, and to those in healt the use of dry dung, and of clay, and of coloring matter. allow, the use, O Bhikkhus, of a pestle and mortar" (udukhalanusalañ ka).

# SIEVES, STRAINERS AND FILTERS.

There is evidence that cloth seive was used by the Hind in ancient days, we find it mentioned in the Rgveda<sup>4</sup>. I purpose of straining and filtering solid and liquid medici respectively is mentioned to have been served by two

Schol. on Katy. 1.3.3.6. footnote, Satapatha Brāhmana (Sacred Boothe East, 1.1.4.8.)

<sup>&</sup>lt;sup>2</sup> Cunningham's Bhilsa Topes, p. 207.

<sup>3</sup> Mohāvāgga VI. 9. 2.

<sup>\*</sup> Rgveda, 10m. 71s. V 2

three layers of a piece of cloth. And we know that in the prehistoric Soma rites, it "was pressed, passed through a seive, mixed with milk, and offered as the main oblation".

The reference to a cloth sieve, we find in Mohāvagga<sup>1</sup>: "Now at that time the Bhikkhus who were sick had need of sifted chunam as medicine.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a chunam sieve".

They had need of the chunam very fine.

"I allow, O Bhikkhus, the use of a cloth sieve".

Pavitra was used in the Vedic times<sup>2</sup>. It was a filter. Wilson translates it: "Trough the purifying filters".

### COLD AND HOT APPLICATIONS.

To relieve colic pains, vessels made of silver, copper or precious stones, containing cold water, are directed to be placed upon the part or better upon the navel<sup>3</sup>. Besides these, leather vessels containing cold water are also directed to be used for reducing the temperature in dilirium tremens.<sup>4</sup>

Rgveda, 3m. 31 s. 16 Rk-

श्रंग्रं टुइन्ति इस्तिनी भरितेर्भध्वः पुनन्ति धारया पविते:॥

Ibid, 3m, 36s, 7Rk,

Caraka Samhitā, VI. xii.

<sup>&</sup>lt;sup>1</sup> Mohāvagga VI. 10. 1.

² मध्य: पुनानाः कविभि: पविवैर्द्धभिर्द्धिन्वंत्यक् भिर्धनुवी: ॥ .

मणिराजत तासानि भाजनानि च सर्व्ययः । वारिपूर्णानि तात्यस्य ग्र्लस्योपरि निचिपेत् ॥ Suśruta Sambitā, VI. xlii.

<sup>\*</sup> इनराजत कांस्थानां पाताणां शौतवारिभि:। पूर्णानां हिमपूर्णनां हतानां पवनाहता:॥

Heat is directed to be applied to the patient's body in various ways<sup>1</sup>:—

- I. Tāpasveda:—palm of the hand, brass dish, sand, cloth, potsherd &c. are the means mentioned for applying heat to the body.
- II. Usnasveda:—potsherds, stone, bricks, or iron balls are to be heated to redness and then water is to be sprinkled upon them. The part to be fomented is covered by a wet piece of thick lint and then the heated materials are to be applied over it. Or heat may be applied by means of a narrow vessel containing hot decoctions. The vessel is to be surrounded by a piece of

तत्र ताप-स्वेद: । पाणि कांस्यकन्दकपाल वालुकावस्त्रे: प्रयुक्तिते श्रयानस्यचाङ्गतापो वस्त्रः स्वादिराङ्गारेरिति । उत्तर्भ-स्वेदस्त कपाल पाषाणिष्टकालो ह-पिन्छानिश्वणांनिङ्ग रासिन्देदस्त द्वयाविते राद्रालक्तक परिवेष्टितसङ्ग-प्रदेशं स्वेदयेत् । सांस रस पयोदिध धान्यास्त्रवातस्र प्रयसङ्ग क्राय पूर्णा वा क्रूकीनहितां प्राहत्योभाषं ग्रज्जीयात् । पार्श्व क्रिद्रेण वा क्रूकीनाधी-मुखेन तस्य सुख्नसीससम्वाय तस्तिन् क्रिद्रे हस्ति ग्रन्छाकारां नाङ्गी प्रथिषाय तम् स्वेदयेत् ।

मुखोपविष्टं स्वभऽक्तं गुरु प्रावरणाइतं।
इस्तिग्राग्डिकया नास्ता स्वेदयेदात-रोगिणं॥
मुखा सब्बोङ्गगा ह्यावा नच क्रिमाति मानवं।
व्यामाईमाचा विवेका हस्ति इस्त समाक्रतिः॥
स्वेदनार्षे हिता नाड़ी कैतिस्त्री इस्ती ग्राग्डिका।

उपनाह स्वेदम्त वातहरसूलक केरस्त पिष्टैर्लवण प्रगादै: सुस्तिन्धे: सुखीर्थे: प्रदिश्च स्वेदयित्। एवं काकी ल्यादिभि: सुरसादिभिक्तिनातसी सर्घप कर्के: क्षणरा पायसी त्कारिका-भिर्वेसवारै: शाल्यों क्वीतनुवस्तावनकी: स्वेदयित्।

द्रव स्वेदस्तु-वातहर द्रव्यक्वाथ पूर्ण कोण्य कटाई द्रोख्यां वावगास्त्र स्वेदयेत् । एवं पयोमांस-रस-मुग्न-तेल-धान्यास्त-प्रत-वसा सूतेष्ववगाहित सुखोणै: क्यायै: परिविचेदिति ।

Suśruta Samhitā, IV. xxxii.

<sup>े</sup> चतुर्क्षिध: स्वेदसाद यथा। तापस्वेद छण्यस्वेद छपनाहस्तेदोद्रव स्वेद इति। श्रव सर्कस्वेद विकल्पावरोध:॥

cloth to prevent the skin from being burnt. Or heat may be applied by the following device:—an earthen vessel or kalasī containing hot decoctions is to be closed; and the vessel is then to be inverted. Then a hole should be bored on its side, and a tube shaped like an elephant's proboscis is fitted to it; the vapour issuing from the tube is allowed to play on the part.

To apply vapour bath:—put the hot infusion of medicinal substances into an earthen vessel and close its mouth. Drill a hole into the side of the vessel and adapt a tube to it. The tube may be either metallic or wooden. The tube should be two hands (forearm and hand) long and made of three pieces; the end of the tube which should taper like a cow's tail must be six anguli long. The patient should be seated on a stool and well covered with cloth. The tube is then introduced inside the blanket, and thus the issuing vapours heat the whole body. (Śārngadhara¹).

Susruta says that the tube should be half byām (i.e., the distance between the two hands when extended) long, bent thrice and shaped like an elephant's proboscis. Sometimes a large stone slab is to be heated with burning wood of Acacia Catechu. Then after removing the ashes, the patient is directed to lie upon it. A tent or cloth-cover having four doors is sometimes required for the patient to sit in, and heat is applied by burning wood outside it.

भवता वातिनर्गाशिद्रव्यकाथरसादिभि:।
उर्चैर्षटं पूर्विता पार्श्वे व्हिद्रं विधाय च ॥
विसुद्रास्यं विख्यक्षांच धातुजां काष्ठजां तथा।
वड्डलुलास्यां गोपुच्कां नाड़ीं युद्धात् विइस्तिकां॥
सुखोपविष्टं स्वस्यक्तं गुरुपावरणाव्यतम्॥
\$\frac{3}{2}\frac{2}{2}\frac{

III. Upānahasveda or poultices:—roots of medicinal plants are to be pressed and formed into a paste with mustard, sesame etc. This is to be heated, put on a thin cloth and so applied.

IV. Dravasveda or hot bath:—the patient is to sit in a tub or vessel of hot water. Iron pails or tubs are recommended to be used by patients to take bath in some infusions. Sārngadhara says¹: The tub (drouī) should be made of gold, or silver, or copper, or iron, or wood. The height and length of the tub should measure thirty-six anguli each. When the patient sits inside, the height of water should stand six anguli above the navel. A drouī filled with oil is to be used for placing an unconscious patient in it to overcome the shock caused by fall, blows, fractures and other injuries.

Cakradatta<sup>2</sup> describes the four methods of applying heat, • Bhāvamiśra also describes them similarly<sup>3</sup>. Hārita, however, mentions seven methods of heat-application<sup>4</sup>.

- विज्ञतपाणिकांस्थवमनै: स्वेदोऽपवाङ्गारकः लेंपादातहरै: सहाम्मलवणक्षेष्ठै: सुखोण्येभेवित्। एवं तप्तपयोऽन्वृवातयमनकाणदिमिकादिभि-सप्तेस्तोयनिषेचनोऽववहहडायै: शिलाये: क्रमात्॥ Cakradatta, Svedādbikāra.
- उस्वेदयतुर्विधः प्रोक्तसापोपस्वेदसंज्ञितः। उपनाचो द्रवः स्वेदः खर्बे वातात्तिं हारिषः। तापस्वेद उपस्वेदय तान्यां संज्ञितः।
  Bhava Prokasa, I. i.
- स्वेद: सप्तविव: प्रोक्ती लीष्टस्वेदो वायस्वेदोऽग्निज्ञालास्वेद: ।
   घटस्वेदो जलस्वेदो पालस्वेदो वालुकास्वेदञ्ञ ।
   Hāritā Samhitā, V. iv.

<sup>े</sup> सीवर्ण राजतं वापि तासमायसच दार्जम्। कोष्ठकं तम कुर्व्वीतोन्क्राये षद्भिंधदङ्गुलम्॥ स्रायामिन तदेवस्यासतुष्कं मस्यं तथा। नाभि: षड्कुलं यावन्त्रम: काथस्य धारया॥ Sarigadhara Samgraha, III. ii.

# BALANCE OR MANADANDA.

For weighing medicinal substances, the scales and balance are often mentioned. They mention a set of weights and measures to be used in weighing substances. Alberuni¹ describes the Hindu balance thus:—"The balance with which the Hindus weigh things, are  $\chi a \rho i \sigma \tau i \omega \nu \xi \epsilon c$  of which the weights are immovable, whilst the scales move on certain marks and lines. Therefore the balance is called tūla. The first lines mark the unit of the weight from 1 to 5, and further on to 10; the following lines mean the tenths, 10, 20, 30, &c. In Fergusson's Tree and Serpent Worship we have a diagram of steel-yard, where a man is represented as stepping in the scale, apparently to weigh himself². The ordinary balance is still in common use amongst the kavirājes of the present day.

## COLLYRIUM POTS.

The Hindus used to apply collyrium to their eyes, from a very early time. It is said to stimulate the growth of eye-lashes, brighten the lusture of the eye-balls and clean the pupil<sup>3</sup>.

Bhāvamiśra\* recommends us to use collyrium as it improves the visual power and cures many diseases of the eye. It is

Suśrutā Samhitā, IV. xxiv.

' सीवीरमञ्जनं नित्यं हितमत्त्र्योस्ततो भजेत्। जोचने भवतस्त्रेन मनोज्ञे मूच्चदर्शने॥ ''सीवीरं'' श्वेत सुरमा इति लोके प्रसिद्धम्। स्रोतीऽञ्जनं मतं श्रेष्ठं विग्रुद्धं सिम्यसम्यवम्॥

<sup>&</sup>lt;sup>1</sup> Alberuni's India. Trans, by Sachau, vol. 1, p. 146.

<sup>&</sup>lt;sup>2</sup> The Tree and Srpent Worship, the pl. lxxxiii. fig. 1.

पचालं विश्वदं कान्तममलोड्युल मण्डलं।। निव्यमञ्जन संयोगाद्भवेद्यामल तारकं।

contra-indicated in patients suffering from fever, emesis, exhaustion, &c.

Susruta mentions collyrium pots of different metals intended for different kinds of collyrium then in use—

$\operatorname{gold}$	pots	for	sweet	collyrium.
silver	pots	for	acid	collyrium.
horn	pots	for	salt	collyrium.
copper & iron	pots	for	astringent	collyrium.
lapis lazuli	pots	for	sour or acid	collyrium.
bell-metal	pots	for	bitter	collyrium.

He also mentions pots of ivory, or crystal, or coral, or horn, or conch-shell, or stone, or gold, or silver.

He also mentions a piece of bamboo for storing collyrium<sup>2</sup>
A bamboo is still used by the poor for keeping oil in India. For a similar purpose the wood of Khadira (Accacia Catechu) is also

हरे: काष्ट्रमलहरं दाइक्षेद रुजापहम्। ऋष्योद्दपाश्वरुषेव सहनेमारुतातपौ॥ नेवेरोगा न जायने तस्मादञ्चन माचरेत्।

"श्रीताऽञ्जनं" क्षणसुरमा इति लोके प्रसिष्ठं॥ "विग्रुडं" श्रोधनं विनाषि। "सिन्धुसभावम्" सिन्धनाम पर्व्वतस्तव सभावम्।

> रावी जागरित: श्रानः कहिंतो भुक्तवांसाया । ज्वरातुर: शिरस्राती नान्धोरस्रनमाचरित् ।

> > Bhāva Prokāśa, I. i.

क्षज्ञकामीक्षणलास्पियङ्गनिलनीत्पलै: ॥ पुष्पैईरियञ्जष्पाद्वापय्यामलक संयुते: । सप्पिक्षयुतिय्र्वियज्ञाद्वामवस्थिते: ॥

Sufruta Samhitā, VI. zvii.

<sup>1</sup> See foot-note 3, P. 67.

recommended<sup>1</sup>. For storing oil, Dṛḍhavala<sup>2</sup> mentions the use of vessels of stone or the horn of a lamb or iron.

### MEDICINE GLASS.

Sukti or shell of mussell was used as medicine glass. The shell of the fresh water mussels unionacea is mentioned to be used for holding a dose of medicine for administering it to a patient8. They generally have equivalve, though not equisided, shells which are covered externally with a smooth brown epidermis and internally by a mother-of-pearl layer. Such a shell "is said to have been formerly much used in Engliand by painters for holding their colour and so the commonest variety is termed unio pictorua. To apply oleaginous errhines, Suśruta<sup>4</sup> recommends us to use metallic pots or the shell of mussel. It is \* still used in India for feeding the babies with milk and also for administering medicines to the patient. Heyne<sup>5</sup> (1814) says that "according to the nature of the disender, the medicines should be taken out of gold, silver or brass vessels. But if these should not be at hand you may use iron or even earthen vessel."

> मैस्योपिहतं युद्धप्रिविहितं वेणगह्वरे। मिदीयक्षदष्टतत्वाजं पिप्लख्य: सेस्यवं मधु॥ रसमामलकावापि पक्षं सम्यङ् निधापयित्। क्षोशे खदिरानिसीणि तहत् चुद्राञ्जनं हितं॥

> > Suśruta Samhitā, Vl. xvii.

<sup>&</sup>lt;sup>2</sup> See foot note; 4, P. 67.

उत्त उपसंन्तृतश्ररीर: प्रात: प्रातकत्थाय पाणिग्रहिमात्रं चौद्रेण प्रतिसंख्ज्योपयुद्धीत। Suéruta Samilitä, IV. x.

<sup>4</sup> वानहस्त प्रदेशिन्य योद्रामितनालायाय विग्रह स्रोतिस दिचय इसीन से इसुण्यान ततं रजत सुवर्ष तासस्यत्पाव ग्रितानामन्यतम यं ग्रत्या पित्तना वा सुखोण्यं से इसदुतसासिश्चेद व्यवच्छित्र-धारं यथानेवेन प्राप्नोति।

<sup>5</sup> Dr. Heyne's Indian Tracts,

### DROPPER:

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The Hindus used a tent of cotton as a drop conductor. Cakradatta¹ advises us to drop medicines into the eyes thus:—the patient should be made to lie down in a place free from draught; the surgeon is to open his eye with the left hand, while with the right, he allows 10 or 12 drops of medicine to fall from a height of two a guli on the eye from a tent of cotton, immersed in medicine contained in a clean vessel.

#### (+RIND-STONE.

Grind-stone to pulverise medicaments is mentioned. In the Mahāvagga<sup>2</sup> we find a reference to it. "I allow, O Bhikkhus, the use of a grind stone, and of another stone to grind upon" (pisana-silâ ka pisana poto ka—Buddhaghosha).

#### STONE AND IRON MULLER.

For similar purpose a stone slab and iron muller are necessary to make pastes and powders of medicines. On the inner face of the left piller in the eastern gate of Sanchi Topes, the kitchen scene is represented, in which "a fourth woman is seated grinding spices or condiments on the sil, or flat stone, with a bant or round muller."

KHAL OR ELLIPTICAL MORTAR OF STONE AND PESTLE.

To prepare medicines to be exhibited to the patients, a small

Cakradatta, Āsotancyānfana Adhikāra.

निवातस्थस्य वाभेन पाणिनोन्मील्य लोचनम्। ग्रुऋौप्रलम्बयान्देन पिचुवन्यां कनौनिके। दश द्वादश् वा विन्दून् द्वाङ्क्लादवसेचयित्।

<sup>&</sup>lt;sup>2</sup> Mahāvagga vi. 3.2.

<sup>5</sup> Cunninham Cunningham's Bhilsa Topes, p. 206.

elliptical mortar is generally used when the medicines require to be thoroughy mixed with some excipient.

The following appliances, besides those mentioned before, become necesary in pharmacy:—

- 1. Iron pails of various sizes.
- 2. Vessels of iron, copper, silver, brass and earth for storing medicines.
- 3. Spoons of wood or darvi; large metallic spoon or hata.
- 4. Iron sandamsa or pinchers.
- 5. Rods of wood or iron.
- 6. Blacksmith's bellows.
- 7. Ankuśa or hooks like the elephant driver's goad.
- 8. Iron hammer.
- 9. Earthen crucibles of different sizes.

# CHAPTER IX.

#### THE CONCLUSION.

In the recent edition of the System of Medicine, Prof. Albutt<sup>1</sup> begins his article on the History of medicine with the following observations: "The medicine of Egypt and the East, extensive and intricate as it was, in so far as it was not Greek did not contain even the rudiments of science. To it Western medicine owes virtually nothing, and in this article at any rate, it may be disregarded". Prof. Osler<sup>2</sup> also speaks in the same strain: "Crude and bizzare among the primitive nations, these ideas of disease received among the Greeks and Romans a practical development worthy of these peoples. There have been systemes of so-called divine healing in all the great civilizations, but for beauty of conception and for grandeur of detail in the execution, all are as nothing in comparison with the cult of the son of Appolo, and of Æsculapius, the god of healing." "Scientific medicine, the product of a union of religion with philosophy, had its origin in a remarkable conjunction of gifts and conditions among the Greeks in the sixth centuries".

Such opinions remind us of an assertion of Sir William Jones<sup>3</sup> "that there is no evidence that in any language of Asia there exists one original treatise on medicine considered as science". About a century has elapsed since the time of Sir William but we see that the same misconception still prevails in the minds of

Albutt and Rolleston. System of Medicine, vol. I, p. 1.

Oslar and Morae's System of Medicine.

Discourse xi, Sir William Jone's Works, Vol. I. p. 161.

the scholars. Macdonell1 gives us a succint account of the intellectual debt of Europe to the various branches of science and art of the Hindus but regrets that the genetic connection of Indian medicine with that of Greece can not at present be definitely settled. "The question as to whether Indian medical science in its earlier period was affected by that of the Greeks can not be answered with certainty, the two systems not having hitherto been compared with sufficient care." The European mind is quite naturally in the habit of tracing all knowledge to Greece, the fountain of all their knowledge in philosophy and science. But impartial writers are not wanting to vindicate the claims of the Hindus. So  $\mathbf{W}$ ise remarks as follows 2:-"Facts regarding the ancient history of medicine have been sought for · only in the classical authors of Greece and Rome and have been arranged to suit a traditional theory which repudiated all systems which did not proceed from a Greecian source. We are familiar from our youth with classical history and love to recall events illustrated by the torch of genius and depicted on our memories; and it requires a thorough examination of a subject, a careful weighing of new evidence, and a degree of ingenuousness not always to be found to alter early impressions. Still candour and truth require us to examine the value of new facts in history as they are discovered, so as to arrive at just conclusions". Royle maintains that "from the mixture, however, of much ignorance and absurdity with what is valuable, many will be apt to despise altogether the medicine of the East. But if it be recollected how long in Europe prevailed the influence of Galen,

<sup>1</sup> History of Sanskrit Literature, ch. xvi.

Review of the History of Medicine. Introduction,

<sup>\*</sup> Autiquity of Hindu Medicine, p. 61, ...- ...

as well as how many absurd formulas still figure in some continental pharmacopæas, as also how comparatively recent is the time since our own was so greatly improved; some feeling of humiliation will control the pride with which we now view the medical sciences". Neuberger says1; "The medicine of the Indians, if it does not equal the best achievements of their race, at least nearly approaches them. and owing to its wealth of knowledge, depth of speculation and systematic construction, takes an outstanding position in the history of oriental medicine." It is no doubt unsatisfactory to find that such notions are still allowed to stand in the way of impartial conclusions by eminent men of science especially by those who write history of medicine. But it is not the fault of the historians alone, the fault lies with us for not having supplied them with adequate materials. Something has been done in this field of research by men like Wilson, Heyne, Ainsle, Royle, Dutt, Thacore Shaheb, Jolley, Hoernle and others, but it is nothing when compared to what is required to be done. To supply this want partially, we have endeavoured in this monograph to describe the surgical instruments of the Hindus, with a comparative study of the instruments of the Greek, Roman and Arab surgeons, and of the surgeons in modern times. By a careful study of this subject, we can not avoid the conclusion that the medicine of India though it was not Greek, contained the requirements of science and has a fair claim to be considered in the history of medicine. To it western medicine really owes something and so the subject has been studied and investigated thoroughly.

Neuberger. History of Medicine. Trans. by Playfair. Vol. I. p. 487.

Apart from the usefulness of the study for collecting materials for the history of medicine, there are good reasons for a critical examination of the subject. The knowledge of the Hindus in medical science was by no means rudimentary. There is evidence to show that they were inferior to none in the quality or quantity of the knowledge of the science at that early age. Hoernle says: 1 "Its extent and accuracy are surprising when we allow for their early age-probably the sixth century before Christ-and their peculiar methods of definition." They practised dissection of human bodies and their anatomical studies have the mark of high order. "We have seen that they used various forms of surgical instruments. The Hindus cut for stone couched for the cataract and extracted the fœtus from the womb". formed abdominal section, practised cranial surgery successfully and no region of the body was thought sacred to the knife. They repaired nose and ears by plastic operations, treated fractures and reduced dislocations, and were experts in performing amputations. They reduced hernia, cured piles and fistula-in-ano by surgical technique, and inoculated and vaccinated for small-pox. surgery was thoroughly understood and arrows were extracted with They were acquainted with the circulation of the blood,2

Suśruta Samhitā, III, vii.

देइस्रीत्पत्तिरस्त्रजो देइस्रोनेव धार्यते। रक्तं जीवस्य चाधारसस्माद्रचेदस्मृव्धः॥

Hoernle's Osteology, Preface. P. iii.

<sup>ै</sup> याभिरिदं ग्ररीरमाराम इत जलहारिणीभि: नेदार इत च जूल्याभिकपिसद्यति-रजुग्टखतेचाकुखन प्रसारणादिमिर्व्विभेषे:। दुमपत्रसेवनीनामित्र च तासां प्रतानास्तासां नाभिर्मुलं ततस प्रसरन्त्यूर्डमधिल्यंक् च।

the distinction between the artery and vein, the use of anæsthetics, the means of arresting hæmorrhage and the proper treatment of surgical wounds. They enumerated 107 vital parts of the body to be avoided, if possible, by the surgeon in practising his handieraft.

In medicine they first propounded the humoural pathology. Though it seems fanciful in the light of modern culture, it must be admitted that no other theory has been attempted to explain the causation of disease in recent times. "They were the first nation who employed minerals internally and to them we owe the therapeutic use of mercury and arsenic in intermittents". They introduced massage, postural treatment and magnet in therapeutics. They excelled in chemistry and contrived many instruments for the preparation of chemical compounds. Atomic theory was discovered by Kaṇāda; and "they knew how to prepare sulphuric acid, nitric acid and muriatic acid, the oxide of copper, iron, lead (of which they had both the red oxide and litharge), '

विस्तता द्रवता रागश्चलनं विजयस्या।
भूत्यादिपश्चभूतानामिते रत्ते गुणाः स्नृताः॥
रक्ते दुष्टे भवेच्छोयो रक्तमख्डलमेव च।
व्यथाःदाइश्व पाकश्व कख्डूच पीड़कोद्गमः।
इन्द्री रक्ताङ्ग नेचलं शिराणां पूर्णता तथा।
गाताणां गौरवं निद्रा मिडो दाइश्व जायते॥

Sārngadharā Samgraha, III. xii. Bhāva Prakāśa, I. ii.

इन्द्रगीपप्रभं चियं प्रकृतिस्थसमंहतम्।

Sārngadhara Samgraha, III. xii.

गूढ़ा: समस्थिता: खिन्धा रोहिन्ध: ग्रह्मशेणितम् ।

Aştānga Hrdaya Samhitā, II. iii.

सञ्जासरं मर्कायतं ।

Suśruta Samhitā, IIĮ. vi.

tin, and zinc; the sulphuret of iron, copper, mercury, antimony and arsenic; the sulphate of copper, zinc and iron; and carbonates of lead and iron. The processes of solution, calcination and distillation were discovered by them.

They understood the action of drugs and no less than 500 classes of medicinal agents are enumerated and arranged according to their virtues in curing diseases, and their remedial agents have been collected from the vegetable, animal and mineral kingdoms. There are 41 different forms in which the medicaments may be exhibited to the patient. We have the earliest notice respecting zoology and botanical geography in their works. They had a complete nomenclature of diseases which are described minutely as regards their ætiology, symptomatalogy, diagnosis, pathology, prognosis and treatment.

Veterinary science was well known to them, and treatises on horses and elephants—Aśvavaidyaka and Pālakāpya<sup>2</sup> are still extant, and will repay perusal. Even there is a treatise on the treatment of plants and trees<sup>3</sup>. Thus we see that the Hindu medical science must not be condemned offhand and requires a careful and sympathetic research by scholars, before it can be excluded from the history of the science.

But I must be careful not to allow my enthusiast admiration carry me too far. It is quite true that the Ayurvedic system has its faults. It has been remarked that "it consisted of erroneous

<sup>&</sup>lt;sup>1</sup> Elphinistone's History of India, 8th ed. p, 160.

<sup>&</sup>lt;sup>2</sup> Another book on the medicine of elephants is quoted by Albertani. See Sachan's Preface to Indica, p. xl.

For the bibliography of the Ayurvedic books, see my work "Materials, Biographical and Bibliographical, for the History of Hindu Medicine". (In the press).

doctrines founded upon a most fanciful anatomy, physiology and pathology. Much indeed could hardly be expected of a science based upon an anatomy which taught that the navel "constituted a centre from which a vascular system, including 40 principal vessels originated; upon a physiology which declared that these vessels were destined to convey blood, air, bile and phlegm to all parts of the body, and upon a pathology which maintained that disease depended either upon derangements of one or more of these humours or "upon the influence of good or evil spirits".<sup>2</sup> It must however be remembered that this criticism refers to a theory elaborated some 3000 years before. The idea that the navel formed the centre of the vascular system apparently had its origin in the fœtal circulation<sup>3</sup>. The position of the heart was well-known and its function as a profeelling organ is

यावत्यस्तु सिराः काये सम्भवन्ति शरीरिणां।
नाभ्यां सर्व्वा निवड्डास्ताः प्रतन्वन्ति समन्ततः॥
नाभिस्थाः प्राणिनां प्राणाः प्राणान्नाभिर्वुपात्रिता।
सिराभिरावृता नाभियक्तमाभिरिवारकैः॥

तासां मूलसिरायलारिंगत्तासां वातवाहिन्यो दग्र पित्तवाहिन्यो दग्र कफवाहिन्यो दग्र दग्र रक्तवाहिन्य:।

Suśruta Samhitā, III. vii.

तस्यान्तरेण नाभेस्य ज्योति:स्थानं घुवं सृतं। तदा धमति वातस्य देहसीनास्य वर्षते॥

Ibid. III. iv.

- <sup>2</sup> A course of lectures on the Principles and Practice of Medicine delivered at Calcutta Medical College. By Francis. 1868.
- मातुष्तु खलु रसवद्वायां नाषां गर्भनाभिनाङ्गे प्रतिवज्ञा साख मातुर्ष्हाररस बौर्यमभिवद्यति । तिनोपखेदेनास्याभिवद्वर्भवति ।

Suáruta Samhitā, III. iii.

described in the ancient •books1. In the later Tantras the origin of the nerves from the spinal cord and the brain is distinctly stated2. The ancient Hindus, like the Babylonians. thought the heart to be the seat of the understanding, and the liver as the central organ of the blood. The Greeks were the most cultured nation at that age, and the knowledge of the two nations can be compared to our advantage. The Hindus did not share with the Greeks the belief that the uterus is "an animal within an animal" and that it can be attracted by pleasant smells and repelled by pungent substances"3. The humoural pathology was also the keystone of the Greecian system. The belief in the good and evil spirit was the only alternative to the pathologists when the microscope and the germ theory of diseases were It is highly creditable to the classical unknown. physicians for banishing superstition from the practice of the art; but we know that the later Greek writers Aetius, Alexander and Paulus, and the Latin medical literature, were free from its baneful influence. The belief in charms and miracles in the cure of diseases seems to be universal and is

Suśruta Samhitā, I. xiv.

जत्यमूलमघः शाखं श्वाकारं कलीवरं। यथात्रत्यदक्षे तद्दत् भरीरे नाड्यस्थिताः ॥

Tantra.

<sup>े</sup> स रस: इ.युच्यते। तस्य च इट्यं स्थानं स इट्याश्चतुर्व्विश्वती: धमनीरनुप्रविश्योदंगा दग्य दग्य चाधीगामिन्यश्वतस्रसिर्थ्यगा: कृत्सं शरीरमहरइस्तर्पयति वर्षययि धारयति यापयति जीवयति चाहष्टहेतुकेन कर्याणा।

<sup>े</sup> दे दे तिय्यक्गते नाखी चतुर्व्वियति संख्या। भैरुद्रख्डेस्थिताः सर्व्वे सूते मिष्मणादव॥

Paulus Ægineta, Adam's Commentary, Vol. I. P. 636.

working even at the present time? Adams says¹ that "considering the faith which many educated persons now repose in the virtues of galvanic rings and garters, the present generation has little ground for laughing at the credulity of our forefathers, with respect to amulets and other phylacteries".

In later times, attempts have been made to substitute other theories in the place of the humoural, and we know with what results. "Paracelsus substituted an equally baseless hypothesis, that the fundamental element of the human body were three principles: sal, the solid element; quicksilver, the liquid; and sulphur, the aerial. This formula was the badge of the Paracelsist school up to the end of the 17th century." Sylvius and Willi (17th century) of the Iatro-chemical school "referred most diseases to morbid matters or "acrimonies" produced by perverted secretions, and these being sometimes too alkaline, sometimes too acid, the antithesis of acid and alkali became the badge or catch word" of their system. Friedrich Hoffman (1660-1742) constructed another system which "supposed life to be a universally diffused ether, which entering the animal body, became transformed in the brain into Pneuma or nervous fluid. "George Ernest Stahl (1660-1734) believed in the hypothesis of Animism, and "the symptoms of disease were regarded as the conscious efforts of the soul to overcome the morbid influences". William Cullen (1712-90) "propounded a new system of medicine, intended to reconcile the opposing views of his predecessors. Its main feature was the importance attached to the nervous system in the causation of disease." Lastly the "Brunonian" system of John Brown, based on

Adam's Commentary on Paul,

the doctrine of stimulus, and Hahneman's theory of homeopathy need be mentioned here to complete the list. Thus we see that even some of the eminent men of science indulged in fanciful theories in quite modern times.

The study of ancient Hindu medicine has an antiquarian It is perhaps the oldest system of medical science still extant. Fragments of Egyptian and Assyrian medicine have no doubt been unearthed. But these cannot be compared with the complete system of the medical science as preserved in the early Sanskrit works on the subject. The Hindus believe their science of medicine to be of divine origin and this belief is founded upon the fact that the existence of the medical profession can be traced back to prehistoric times. humoural theory is mentioned in the Rgveda<sup>2</sup> to the consensus of opinions amongst the according European savants can not be later than 2000 B.C., and possibly earlier. The Buddhists relate a story, how, in one of his former births, Buddha was born as a medicine-man. Mahosadha birth the archangel Sakka came to him he was being born, and placing some fine sandal-wood in his hand, went away. He came out from the womb holding this in his fist. His mother asked him "What is it you hold, dear, as you come?" He answered "Medicine, mother!" So because he came holding medicine, they gave him the name of medicine-child (oṣadhadhāraka). Taking the medicine they kept it in a chatty (an earthenware water-pot) and it became

Medicine in modern Europe. Payne in Albutt's System of Medicine, vol. I, p. 26, 29, 34.

भोमानं शंबीभैमकाय स्नवे विधातु धर्म वहतं ग्रमस्यती ॥

a drug by which all the sickness of the blind and deaf and others as many as came, was healed—so the saying sprang up, "This is a powerful drug"; and hence he was called Mahosadha (The great medicine-man).¹ This early date of the science amongst the Hindus is not exceptional. It is now well-known that so severe an operation as trephining the skull was often performed in the early stone age. "Trephined skulls from neolithic period have been found in most European countries, in Algiers, the Canaries, North America, Mexico, Peru and the Argentine". In the Code of Hammurabi, king of Babylon (2285-2242 B. C.), there are thirteen articles regulating medical practice. One deals with the responsibilities of a surgeon performing operations on the eye. The laws Hammurabi lay down that:—

"If a Physician cause a severe operation wound with a bronze operating knife and cure the patient, or if he open a tumour (cavity) with a bronze operating knife and save his eye, he shall have ten shekels of silver.

"If it be a freedman, he shall have five shekels.

"If it be any one's slave, his owner shall give the physician two shekels of silver.

"If the physician make a severe wound with a bronze operating knife and the patient die, or if he open a growth with a bronze operating knife and the patient lose his eye, he shall have his hands cut off.

"If a physician make a severe wound on the person of

Rhys David's Buddhist Birth Stories, vol. I, p. 67-68.

Neuberger's History of Medicine, P. 3.

a slave belonging to a freed man with the bronze operating knife and kill him, he shall replace the slave by another slave.

"If a physician heal a broken bone or cure diseased bowels, the patient shall pay the physian five shekels of silver."

Homer pays tribute to Egypt for her

"Patron-god imparts

To all the Pharian race his healing arts."

Herodotus says that the Egyptian physicians were specialists of particular diseases, and Clement of Alexandria mentions fortytwo Hermetic books on medicine by the god Thot.

"According to Manetho, he (Teta) constructed the Royal castle of Memphis and wrote a work on anatomy<sup>2</sup> being particularly occupied with medicine. The latter supposition is rendered more complete to a certain extent by the account, due to Ebers Papyrus<sup>3</sup>, that the method of making the hair grow, described accurately therein, was supposed to have been discovered by our king's mother, Shesh." Teta was the second king of the first dynasty of the old Memphis kingdom and flourished in 4366 B.C. King Senta of the second dynasty owned a medical work which belonged to Semti or Hesepti (4266 B.C.), the 5th king of the first dynasty. Tosorthros of the third dynasty, was said to have composed a treatise on medicine, a fact which

<sup>1</sup> Neuberger. History of Medicine, P. 18.

Manetho, in Müller-Didot, Fragmenta Historicum Græc, vol. II, pp. 539, 540.

<sup>\*</sup> Ebers Papyrus, Pl. lxvi, 1, 5.

<sup>·</sup> Historian's History of the World, vol. I, Egypt and Mesopotamia. p. 91.

Ibid, p. 68.

Manetho, etc., vol. II, p. 544.

caused him to be identified with the healing god Imhotpû."

These facts suggest a great age for Egyptian medicine, Medicine flourished among the Assyrians: "Fragments of an old work on medicine have been found, which show that all known diseases have been classified and their symptoms described; and the medical mixtures considered appropriate to each being compounded and prescribed quite in modern fashion."

The oldest medical treatise extant amogst the Chinese is the Neiching, the authorship being attributed to Hwang-ti; it dates back to B. C. 2597. Mr. Gatzlaff,<sup>3</sup> missionary in China, has given us a short view of a celebrated work, in 40 volumes, on Chinese medicines, which is called Ching che chun ching *i. e.*, . "Approved marking line of medical practice." So the Hippocratic treatises (460 B. C.) are rather modern compilations compared to these ancient Looks; and as told by Plato, the priest of Sais was fully justified when he addressed to Solon: "You Greeks, you are but children."

It will be seen again that a comparative study of the science discloses remakable affinity to the systems of the other contemporary nations. The fabulous origin of medicine in India and Greece can not fail to attract the notice of even a casual observer. The resemblance of Dakṣa, the preceptor of the two Asvins, the offspring of Sun, who after learning the

<sup>&</sup>lt;sup>1</sup> Ibid, p. 544 and 545.

Quoted in Maspero's "The Dawn of Civilization." Edited by Prof. Sayce, 5th ed. p. 238.

<sup>&</sup>lt;sup>2</sup> Assyria; its Princes, Priests and Peoples, Sayce, p. 119.

Proceedings of the Asiatic Society, Part VII, p. 154.

<sup>·</sup> Royle. Antiquity of Hindu Medicine, p. 67.

<sup>1</sup> Timesus, p. 22.

Avurveda from their father became the medical attendants of the gods, to Æsculapius—the reputed son of Apollo, and his two sons Machaon and Podalarius, celebrated in the Homeric poems, is indeed remarkable. More remarkable is the belief in humoural pathology shared by the two nations, separated from each other by continents and seas, and alienated from each other by the differences in customs, manners and religion. The theory of independent origin and development falls to the ground, especially when we consider the strange coincidence in the surgical instruments used by the two nations in performing surgical operations. Some of the instruments used by the Hindus were not only identical in structure and shape to the instruments of the Greeks, but they had even the same name. Thus for instance, the alabu yantra of the Hindus corresponds to the description of the cucurbitula of the Greeks, and both the terms mean a gourd. A śrnga is the horn; anguli yantra or mudrikā is the finger or ring-knife; yoni-vraneksana is the diopter or vaginal speculum; ankuśa is the hook; &c. Some instruments though they have different names are identical in structure and uses. Thus, the Scammum Hippocraticum or the Plinthium Nelei is the Greek counterpart of the Hindu kapātasayana; the lithotomy binding of the yantrasatakam; the clyster of the vastiyantra; the saw of the karapatra; the needle of the sūcī; &c. Again many surgical operations are similarly described in both the systems, as for examples, the operations for stone and In the description of diseases, cataract may be cited. passages occur in books which seem to be a literal translation of one from the other. Thus in describing the symptoms of hydrophohia, Paulus quotes Rufus who pronounces it to be a

species of melancholy and then observes "Which reason accords also with those who say that they think they saw the image of the dog that bit them in water". The word "those" in the above sentence becomes clear to us when we read a similar passage in the kalpasthāna of the Suśruta Samhitā, and it may be thus translated: "If the patient sees the image of the animal that bit him in the water or mirror, he is sure to die." Other passages might be multiplied but our limited space forbids any further quotations. All these coincidences can scarcely be accidental; and though we may not be able to trace the actual progress of medicine from India to Greece, yet the evidence in favour of its transmission is too strong to be held in doubt.

Thus the question of the relation of the medical science of the Hindus to that of the Greeks naturally suggests itself for solution. The possibility of a dependence of the either on the other can not be dismissed offhand for we have historical evidence of communication between the two nations at a very early age. We need not dwell at length upon those shoals and quagmires of historical controversies, the alleged conquest of India by Egyptian Seostris as recorded by Diodorus Seculus<sup>2</sup> in prehistoric times; the connection of the Phænician traders as proved by the articles of merchandise,—cinnamon, aloes, onyx, agate, ebony, tin and ivery<sup>3</sup> diamond, gold and

Suśrutā Sāmhitā, V. vi.

भप्सुवा यदिवाद्यें रिष्टं तस्य विनिर्द्धित्॥ वस्यत्यक्तस्माद् योऽभीन्त्रां यत्नादृष्टापि वा जलं। जलवासन्तविद्यात्तं रिष्टं तमापिकौर्त्तितं॥

<sup>&</sup>lt;sup>2</sup> I. ib. I. ch. 43. Nolan.

s Strabo. xv 37. (Quotes Megasthenes; Theophrastus quoted by MacCrindle in Ancient India as described by classical authors, p. 46; Virgil. Georg. 11. 116-17 ("India alone preduces black ebony"), Georg. 1. 57. ("India sends Ivory"), Lonsdale and Lee's trans.; Horace, odes 1. 31.

embroidered work the commercial enterprises of the ships of Solomon (992 B. C.) from Ezion-Gaber<sup>2</sup> under the guidance of the mariners of Hiram (B.C. 980-917) which brought back the gold of "ophir," its almug trees and ivory, apes and peacocks; the possibility of an Indo-Hellenic intercourse to explain the remarkable coincidences between the systems of philosophy current amongst the two nations, and which culminated in the bold theory of Pococke<sup>3</sup> that Pythagoras. who is generally considered to be the founder of the healing art amongst the Greeks4 was an adaptation of the Buddhugurus. and the assertion that Greece must have been an Indian colony before. Let us rather tread on firmer grounds and we know that two Greek physicians, Ktesias (about 400 B.C.) and Megasthenes (300 B. C.) visited Northern India. Ktesias in his Indica mentions the cochineal plant, its worm and dves. monkeys, elephant and parrot. He says that the Indians were free from headache, toothache or ophthalmia and from mouth sores or ulcers. Alexander the Great (B.C.327), so says Nearchus, employed some Hindu vaids in his camp in India to consult them in cases of snake-bites and other dangerous ailments. Megasthenes mentions ebony as growing in Bengal, and tiger, monkey and elephants are also alluded to. Strabbo mentions that Daimacus was sent to the court of Candragupta's son. but unfortunately the book he wrote about India is lost to us. Mention also should be made of the intercourse of Egypt with India under the Ptolemies and we know, that Ptolemy

<sup>&</sup>lt;sup>1</sup> Birdwood's Industrial Arts of India, pp. 263-4.

<sup>&</sup>lt;sup>2</sup> I. King. ix. 27; xii, p. 22.

<sup>3.</sup> India in Greece.

A See the Origin and Growth of the Healing Art-Bedroe. 162.

Philadelphous sent an embassy headed by one Dionysos to the court of Pataliputra. Another source of dessimination of Hindu learning over the Western world is the emigration of the Buddhist missionaries to the kingdoms of Ptolemies and Greek kings as proved by the edicts of Asoka. "And the Greek Simnoi (venerable) were no other than the Buddhist sramanas (these simnoi whom Clement of Alexandria has narrated to have rendered worship to a pyramid originally dedicated to the relies of a god, were the Buddhist Arhats (venerable) sramanas).1 intercourse of the East and West after the Christian era is well known and will not supply us with any proof as to the indebtedness of the Greeks and Hindus to each other; though "Dietz proves that the late Greek physicians were acquainted with the medical works of the Hindus, and availed themselves of their medicaments"; but he more particularity shows that the Arabians were familiar with them, and extolled the healing art as practised by the Indians, quite as much as that in use among the Greeks.2

But what is more important to us as a proof of the influence of the Indian medical science upon the Greecian system is the identification of drugs of Indian origin in the meteria medica of the Greeks. For instance the Sacred Bean of Pythagoras has been identified with Utpalam or Indian Nelumbium. Hippocrates the Great, who was contemporary and kinsman of Ktesias the court physician to the king of Persia, mentions:—Sesamum Indicum (Tila); Nardostachys Jatamansī

<sup>&</sup>lt;sup>1</sup> Lalitvistaram. Mitter's ed. ch. 1.

<sup>&</sup>lt;sup>2</sup> Journal of Education, Vol. viii, p. 176.

<sup>&</sup>lt;sup>3</sup> Pratt's Flowering Plants, Vol. 1, p. 67.

<sup>4</sup> Galen; Comment, in libr. de artic. iii.

(Jatāmāmsī); Beswillia Thurifera (Kunduru); Zinziber Officinale (Srigavera); and Piper Nigrum (Marīci). Dioscorides (1st century A.D.) in his Materia Medica describes:—Agallochum, Bdellium, Ebony (Diosphynos Ebenaster), Ammomum zinziberis (Ginger), Calamus aromatious (sweet cane of Scripture), Eletteria Cardamonium (Elaci), Lycium Indicum or Russot, the product of Berbera lycium, Atramentum (Indigo), Onyx or the operculum of an Indian shell-fish, etc. In later times, we find Aetius, an Alexandrian writer of the 5th century describing Indian nuts, sandal wood, cocoanuts, etc. Symon Set mentions camphor; and Paulus Aegineta (7th century A.D.), a writer well known for his judicious condensation of the Greek medical literature, mentions Aloes, Cantharides \*Cichory), Cloves (Caryophyllum Aromaticus), Millet (Panicium Halicum), Costos (root of Auklandia Costos), Cassia (Cinnamomum Cassia), Indian stones as amulets, Malabathri or tejpāt (Laurus Cassia), Ambar, etc.

Now let us reproduce some of the conclusions arrived at by Western scholars as the result of the controversy. As regards philosophy, Colebrooke<sup>1</sup> asserts that "the Hindus were teachers and not learners". Cunningham<sup>2</sup> says: "Indians have the advantage in point of time; and I feel satisfied that the Greeks borrowed much of their philosophy from the East" Weber<sup>3</sup> remarks that "there is no ground whatever to suppose that Susruta borrowed his system of medicine from the Greeks, on the contrary there is much to tell against such an idea".

<sup>1</sup> Transactions of the Royal Asiatic Society, vol. I.

<sup>&</sup>lt;sup>2</sup> Bhilsa Topes, pp. 32-33.

Bistory of Indian Literature,

Prof. Diaz of the Konnigsberg University, detects the principles of Indian medicine in the medical literature of the Greeks". "It is to the Hindus" says Wise, "we owe the first system of medicine." Royle has proved beyond doubt the indebtedness of the Greeks and Arabs to the Hindus. Haas's theory that Susruta is the Indian adaptation of the Arabic name of Sugrat or Buqrat, the Arabic corruption of the Greek Hippocrates, and that Kāsi is an adaptation of the Island of Cos has been deservedly condemned as "an elaborate joke". Neuberger says: 1— "The similarity between Indian and Greek medicine of the period is in its outline and in certain details so striking that it is hardly surprising that the originality of the former has frequently been questioned or even denied. The more so is this true since the dates of the more important Indian works are fixed with the greatest difficulty, and before the discovery of the most recent manuscripts they were quite indefinite.

In consideration of the outstanding independent achievements of the Indians in most branches of science and art, and of their aversion from foreign influences, the trend of opinion to-day, informed by recent discoveries is in favour of the originality of Indian medicine in its most salient features."

Another fact must here be pointed out that the Hindus always acknowledged any help they might have received from other nations for the development of their science. The striking proof of this is found with reference to the science of astronomy—the only branch of learning which seems to have been influenced by the Greeks. Varāhamihira compiled his famous Pañca-sidhāntica or the collection of the five old treatises on astronomy,

<sup>&</sup>lt;sup>1</sup> Neuberger. History of medicine, Vol. I, p. 45.

viz., Paulisa, Romaka, Vasietha, Saura, and Paitamoha. Both Weber and Kern have no doubt that Paulisa was a Greek and the name Romaka speaks for itself. But in the Hindu medical literature there is no mention of any foreign help, and the Indian medical treatises do not contain a single technical term which points to a foreign origin. It is interesting to quote the well known passage of Garga: "The Yavanas (Greeks) are Mlecchas, but amongst them the science (astrology) is well established. Therefore they are honoured as Ris-how much more than an astrologer who is a Brāhman". It is a standing monument of the catholic spirit of the Hindus, and they know no better way to show their respect for the learned men of the world. To this may well be contrasted the behaviour of the Greeks towards the other The doctrines of Pythagoras are pre-eminently Indian 1, nations. but that philosopher has not a word to speak of the Hindus. In. astronomy the Greeks are indebted to Babylon: Ptolemy mentions that Hipparchus worked out and improved upon the astronomical computations of the Babylonians with reference to the moon; but recent discoveries from the clay tablets have shown that the figures ascribed to Hipparchus are merely copied from the numerical values worked out in Babylon. "The discovery of the precession of the equinoxes is generally ascribed to Hipparchus. It was he indeed, who brought this fact to the Greeks, and he estimated its yearly amount as from 36 to 39 seconds, but it is certain that he learned about it in Chaldea, and that he obtained the elements of his calculations from the astronomical observations made on the lower Euphrates". 2 Paulus Aegineta

<sup>&#</sup>x27; See Enfield's History of Philosophy.

Historian's History of the World. Vol., I, p. 596.

gives us a complete system of operative surgery of the ancients. Celsus, in the last two books of his work, has treated of the surgical operations with considerable accuracy; and though the former availed himself of the labours of the latter, Celsus is never mentioned as one of the sources of informations used by Paulus who appears to have been wholly unacquainted with his works; and Adams remarks "but when did a Greek writer ever acknowledge himself under obligation to a Roman"?

But are we to suppose that the Greeks wilfully concealed the names of the Indian physicians in their books? Surely not. The Greeks might not have known the real source of the informations which they probably received second-hand. There is historical evidence of an intercommunication between Greece and Persia from the time of Ktesias or the 4th century B. C. to the . 6th century A. D. We also know of a tradition that the services of the Great Hippocrates—a kinsman of Ktesias, were required in the Persian court, but he declined the invitation. Again we know that books on ancient sciences of India were possibly made use of by the Persians in early times, and to this intercommunication may be due "the coincidences which have been observed between the science of the Greeks and •that of the Hindus" (Royle).

As regards the indebtedness of the Persians to Sanskrit literature," we have positive testimony on the subject, as the Baron de Sacy, in his account of the well-known Sanskrit origin of the Fables of Pilpay, states that these were first translated in Pehlevi during the reign of the Persian, king Nooshirwan, who ascended the throne in 531, and died in 579 and who is reported by historians to have encouraged learning, and to have induced Greecian philosophy at his court. The translations

were made by the physician Barzouyeh who had brought the original from India with other books, and who by more than one previous journey to that country, had acquired a knowledge of Sanskrit. He is stated particularly, to have made two journeys, one for the purpose of procuring medicaments and herbs, and the other for obtaining specimens of literature of the Hindus". "Previous even to this (A. D. 330), we hear of the Persian king Bahram visiting, in disguise, the court of Basdeo, sovereign of Canouge, to study the laws, religion and manners of the Hindus."

But whatever differences of opinion there may be as regards the relation of the Greeks to the Hindoos, there is no doubt that the medical science of the Arabs was materially influenced by Hindu medicine. For we know that the medical treatises of Caraka, Suśruta and Mādhava were translated into Arabic in the beginning of the 8th century A. D., and the names of Scarac, Scirac or Xarac and Sarad occur in the Latin translations of Avicenna, Rhases, and Serapion. Rāy dwells at length on the similaritry of description of leeches as written by Suśruta and Rhazes. The modern medical science of the West is principally based on the Greecian system as preserved in the books of the Arabian authors and so indirectly depends for some particulars at least upon the Indian system.

Sachau in his preface to Alberuni's India remarks as

<sup>&</sup>lt;sup>1</sup> Antiquity of Hindu Medicine, p. 168-69.

<sup>&</sup>lt;sup>2</sup> Ibid, p. 73.

Rhazes: 'De Emblico,' (Scarac Indianus), 'De Zinzibere, (Surue)
 Serapion: 'De Myrobalanis' (Xarch Indus), 'De Emblicis et bellericis (Xarcha Indus); Avicenna: 'Sub Emblico' (Scirac Indum).

<sup>&</sup>lt;sup>4</sup> Alberuni's India, Preface, p. xxx-xxxi.

follows:—"What India has contributed reached Bagdad by two different roads. Part has come directly in translations from the Sanskrit, part has travelled through Iran, having originally been translated from Sanskrit (Pali? Prakrit?) into Persian, and further from Persian into Arabic. In this way, e.g. the fables of Kalila and Dimna have been communicated to the Arabs, and a book on medicine probably the famous Caraka. cf. Fihrist r. 303". The Arabs also translated "Indian works on snakes (sarpavidya), on poison (visavidvā)......on the veterinary art1......But not only were the medical books translated into Arabic we. have evidence that Indian doctors practised in foreign courts. continues:2 "Another influx of Hindu learning took place under Harun (A. D. 786-808). The ministereal • family Barmak, then at the zenith of their power, had come with the ruling dynasty from Balkh, where an ancestor of theirs had been an official in the Buddhistic temple Naubehar, i. e., nava vihāra—the new temple (or monastery). The name Barmak is said to be of Indian descent, meaning paramaka, i. e., the superior (abbot of the vihāra?) cf. Kern, Geschichte des Buddhismus in Indien, ii. 445, 543. Of course, the Barmak family had been converted, but their contemporaries never thought much of their profession of Islam, nor regarded it as genuine. Induced probably by family traditions, they sent scholars to India, there to study medicine and pharmacology. Besides, they engaged Hindu scholars to come to Bagdad, made them the chief physicians of their hospitals, and ordered them to translate from Sanskrit

<sup>&</sup>lt;sup>1</sup> Alberuni's India, Preface, p. xxxiv.

<sup>&</sup>lt;sup>2</sup> Ibid p. xxxii.

into Arabic, books on medicine, pharmacology, toxicology, philosophy, astrology, and other subjects. Still in later centuries, muslim scholars travelled for the same purpose as the emissaries of the Barmak, e. g., Almuwaffak, not long before Alberuni's time (Codex Vindobonensis, sive medici Abu Mansur liber, fundamentorum pharmacologiæ, Ed. Selignann, Vienna, 1859, pp. 6, 10, and 15, 9)."

"Harun-al-Rashid (786-809) had two Indians Manka and physicians at his court"1 Manka translated the classical work on medicine, Susruta (cf. Steinschneider, · Wissenschaftliche Blätter, Vol. l, p. 79) and a treatise on poison, ascribed to Kânakya, from Sanskrit into Persian (see Prof. Flügel, in Zietschrift der D. M. G. xi. 148 and s. 325). A Hebrew treatise on poison, ascribed to the Indian Zanik (Kanakya) is mentioned by Steinschneider Wissenschaftliche Blätter, Vol. 1, p. 65). Alberuni mentions an Indian Kankab as astrologer of Harun-al-Rashid (Reinaud, memoire sur l' Inde, p. 315). He is likewise mentioned as a physican. Another Indian physician of Harun-al-Rashid is called Mankba (Reinaud). In the year 1381, a work on veterinary medicine ascribed to Salotar was translated from Sanskrit by the order of Firroz Shaha after the capture of Nagorecote. A copy of it was preserved in the Royal Library of Lucknow2. Among the Hindu physicians of the time one. البرى دهري is mentioned i.e., the son of DHN, director of the hospital of the Barmaks in Bagdad. This may be Dhanya, or Dhanian chosen probably on account of its etymological relationship with the name Dhanvantari the name

Prof. Dietz, quoted by Royle, p. 64.

Maxmüller's Science of Language, Vol. I, p. 166.

of the mythical physician of the gods in Manu's law book and the epics (cf. A Weber, Indische Lithuraturgeschichte, pp. 284, 287). A similar relation seems to exist between the names Kanka, that of a physician of the same period, and Kankayana, an authority on Indian medicine (Weber 1. c., pp. 287, note, and 284 note, 302). The name اطر, that of an author of a book on drinkables, may be identified with Atri, mentioned as a medical author by Weber, 1. c. p. 288."1

For informations on the Arabic translations of Sanskrit works, see Analecta Medica by Dietz; Wustendeld's Geschichte der Arab Aerzte; Cureton, "A collection of such passages relative to India as may occur in Arabic writers"; Wilson's note to the above in J. R. A. S. old series, vi, pp. 105-115. Puschmann, p. 162; and Bedræ, book iv. ch. 11. pp 286-299.

The Arabians added many durgs to the meteria medica of the Greeks and amongst them we find the following Indian drugs described :---

Diudar or Pinus Deodara	Devadāru²
Artemesia Indica	$$ Nā $\operatorname{gdamani}$ .
Piper cubeba	Sugandha marica.
Cassia fistula	•
Senna or Cassia obvata	
Galangal or Alpina galangal, Roxb	
Ammomum grana paradisi.	•
Maeis	Mace.
Nux moschata	

<sup>·</sup> Sachau, Ibid p. xxxii.

It is described by Avicenna under its Sanskrit name, where he says that deiudar. "est ex genera abhel juniperus, que dicitur pinus Inda; et syr mindar est ejus lac" (Quoted by Royle).

Bdellium	Guggula.
Tamarindus Indica	Tintidī.
Trifolia	Triphala. 🔭
Myrobalani	Haritaki.
Turpeth or Convolvulus Turpethum	Trivit.
Sel or Aegle marmelos	Vilva.
Santalum rubrum	Candana,
Melia azadirachta	Nimba.
Tembul (Piper betel)	Tāmbūl.
Faufil (Arecha catechu)	Khadira.*
Nux vomica	Vișamuști.
Musa paradisiaca or plantain	Kadalī.
Moschos moschifera (from Thibet & Inc	lia)Mṛganābhi.
Polichos lebleb.	
Orange or Citrus aurantium	Nāgaranga.
Limon or citrus medica	Mātulunga.
Pearls and other precious stones such as	lapiz lazuli. Borax,
Rhabarburnum or Indian Rhubarb, etc.	
TXT	

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We can trace the Arabic and Greek names of some of th medicuments to a Sanskrit source. Royle has discussed then at length, so we need give here only a synopsis of it:-

Triphalā (S)—Tryphalla (A)—Tryphalla (G)—Tryphala parva (modern).

Devadāru (S)—Deiudar(Avicenna) — Deedara (G)—Pinus deodaru.

Tvaka-kshira (S)—Tabosheer (A).

Tamālpatra (S)—Malatroon or Malabathrum (G).

Tejapatra(s), or tuj-Sadej (A).

Actuarius copies from Serapion and Mesue, the use of this medicine The very name is Sanskrit, meaning the 3 myrobalans. Scrapion refers to Xarch indus or Charak, in his De Myrobalani (Royle, P. 37),

Tāmbula (S)—Tumbol (P)—Tumbol (A).

Pippalī (S)—Pippul (H)—pilpil (P)—filfil ( $\blacktriangle$ )—(G)—piper (E).

Sringavera (S)—Shimgveez (P)—Zinzabil (A)—Zingiber (E).

Aguru (S)—aggur (H)—Agila (M)—Pao-d'aglia (aquilia) (po)—Aod Hindee Agallochum (G).

Candana (S)—chundan (H)—Shandana (T)—Sundul (P)—Santal (E).

Kolinjana (S)—Galanga (G).

Vaca (S)-Wuz (A).

Dāvrusita (S)—Darcheeni (H)—Darsheeni (A).

Cacyn-nama (C)—Akimona (P)—Kaimanis (M)—Cinnamon.

Kustha (S)—Kooth (H)—Kust (A)—Koosrus (G)—Koshta (Sy).

Abnus—Ebony (E).

Kubara (S)—pupal (P)—fufal (A).

Sajikā (S)—Sajiimattee, sajiloon, sajii (H)—Sajimen Vitri (Geber)—Soza or soda (E).

Khar, khari (S)-Kali. (A).

Kussas, missy (India)—misy (A)—misy (G).

Tincana (borax)—Tinkar (P)—tincal (E).

Ambara (S)—Kharoba (A)—Amber, Ambegrise (E).

Kassis (tin)—Kassiteros (G).

Tuttha (S)—tootum or tutia (H)—tutia, (P)—tatanagum (T)—tutenagun and tutty.

Manasilā (S)—Mansil (G).

Haritāl (S)-hartal.

Sarkarā (S)—sakkara (T)—sukkur (A)—Sugar (E).

Sandaracha (S) or sulphuret of arsenic—Zarnach (P & G).

Sphotaka (S)—phoska (B)—poeca (A. S.)—pocke (Ger).

Tintidi. (S)—Tamar Hind (A)—Tamuarin (Fr)—Tamarinds (Italy & Sp.)—Tamarind (P)—Tamarindus India (L).

Masurikā (S)—Masern (Ger)—Measles (E).

Vrana (S)—verole (Fr)—variola (L).

Danga (Hindus)—Dandy—Dengue (Sp).

S—Sanskrit. A—Arabic. G—Greek. T—Tamil. P—Persian. M—Malayan. Po—Portuguese. Sy—Syriac. Ger—German. A. S.—Anglo-Saxon. H—Hindi. E—English. B—Bengali. F—French. L—Tatin. It—Italy. Sp—Spanish.

Not only is the influence of the Sanskrit medical works detected in the Persian, Hebrew, Arabic, Greek and Roman works on medicine, there is evidence that the Hindu system of medicine was also adopted by the Tibetans and the Chinese. January No. 37 of the J.A.S.B. 1835 Vol. IV, an analysis of a Thibetan work is given by Alexander Csoma de Koros. It is called "rgyud bzhi" (the tract in 4 parts). It is attributed to Sakhya. "In the time of Khrisrong Dehutsan (i.e. 8th or 9th century of the Christian era) a Tibetan interpreter Bairotsana (or Vairochana) having translated in Cashmere, with the assistance of physician-pandit (Davam Non-gah) presented it to the above mentioned Thibetan king." In a Note on Thibetan surgical instruments, Walsh says:1 "The present practice of surgery in Tibet is very simple, and, as already noted, consists chiefly of cupping, cauterizing, and bleeding. The Am-chhi informed me that the only instruments used are the cupping-bow ( ) me-pun, or जेनुद्ध me-bum, both meaning 'fire vessel'), in which

<sup>&</sup>lt;sup>1</sup> The Thibetan Anatomical System by E. H. C. Walsh in J. R. A. S. 1910, pp. 1244-45.

paper is lit and the bowl is placed while hot over the part to be blistered; the sucking-horn (RANN Ajib-ru), by which cupping by vacuum is done; the castery (RANN Ichags-me), the lancet (BC rtsa-u), for bleeding, and a golden lancet (RANN greekyi rtsa-u) for operating on the eye.

In the journal of the Buddhist Text Society of Calcutta for 1894 three Tibetan block prints are illustrated, which contain representations of a large number of surgical instruments, some of them of an elaborate nature, including specula, saws, catheters, exploring needles, instruments for tapping hydrocele, and midwifery and other forceps. The block-prints were brought by Rai Saratchandra Das, Bahadur, from Lhasa, and a description of the figures was given by the late Lama Ses-rab MGya Mtsho, the Abbot of Ghoom Monastery, near Darjeeling, who was formerly physician to the late Tashi Lama, which were explained in a paper read by Dr. Saradaprasad Banerjee.

If the elaborate and various instruments shown in the blockprint were ever in general use they appear to have now ceased to be used."

In the J.R.A.S. April 1907, is mentioned "a Chinese text corresponding to a part of the Bower manuscript" by Watanbe. The identified portion of the MSS. consists of the six leaves which appear in plates XLIX-LIV (Hoernle's ed). The corresponding Chinese text is contained in six translations of which the following three, correspond completely to the MSS.

<sup>&</sup>lt;sup>1</sup> Journal of the Buddhist Text Society, Vol. II, Pt. III, Calcutta 1894. P. III.

<sup>2</sup> Ibid, pp. IX. X.

- 1. Mohamayuri vidya-rajui—translated by I'tsing 705 A.D.
- 2. ,, , , Amoghavajra 746 to 771 A.D.
- 3. " " " Sanghapala 516 A.D.

Again many articles are common to the Hindus and Chinese materia medica; as many aromatics (nutmeg, cloves, cinnamon and pepper), musk, rhubarb etc. And this is not at all surprising for we have evidence "that there was constant intercourse¹ between these countries even before the Christian era, by means of travellers and ambassadors; and that Buddhist priests in visiting China, took with them as presents classical Indian books. It is also worthy of note, in connexion with the chapter on this subject in Susruta, that in A.D. 648, the Emperor of China having sent an ambassador to India, this officer met with a doctor, who told him that he was 200 years old, and that he possessed the recipe of immortality, upon hearing which, a second embassy was despatched in search of the philosophical stone" (Royle).

Even the modern medical science of Europe has been directly influenced by the Hindu system of medicine. In the materia medica used by the doctors in Europe now, we find the following curative agents—the produce of India. I quote here the list as prepared by Thakore Shaheb<sup>2</sup>:—

"Aconitum heterophyllum ... Ativisha.
Allium cepa ... Polandu.

• Acacia catechu ... Khadira.

<sup>&</sup>lt;sup>1</sup> See Asiatic Journal, July 1836.

History of Aryan Medical Science, P. 128.

Alhagi maurorum Yavasa. Alstonia scholaris... Saptaparna. Ela. •Ammomum elettarum Andropogon nardus Ushira. Katurina. Andropogon schænanthus Artemisia sternutatoria Agnidamani. Berberis lycium ... Daruharidra. Palasha. Butea frondosa Sonamukhi. Cassia lanceolata ... Indravaruni. Cucumis colocynthis Dhatura alba, niger &c. . . . Dhattura. Justicia adhatoda... Atarusha. . . . Katukoshtaki. Luffa amara Linum usitatissimum Atasi. . . . Mallotus Philippiensis Kapillaka. . . . Katfala. Myrica sapida Ophelia chiretta and Ophelia Kirata. augustifolia ... Pimpinella Anisum Shatapushpa. . . . Karanja. Pongamia glabra... ... ... Ajamoda. Ptychotis ajowan ... Ricinus communis Eranda. ... Undurkarnika. Salvinia cucullata Santalum album & Santalum flavum Chandana. Shorea Robusta ... Ajakarna. Strychnos potatorum, Strychnos

Katakafala.

Guduci,

. . .

. . .

nux vomica ...

Tinospora Cordifolia

Valeriana Hardwicki ... Tagara.

Wrightia Antidysenterica ... Indrayaya."

To this list may be added the following; drugs from the Indian and Colonial Addendum to the British Pharmacopæa, 1898:—

Vāvvula.

Dāru-haridrā or darvi.

Chālmugra.

Kokilāksa.

Acacia Arabica

Acalypha Indica ... Muktabarşi. Andrographis Paniculata Kirāta. Aristolochia Indica Arkamula. Arachia Hypogaea ... Bucanaka. Citrus Aurantium Nāgaranga. Azadirachta Indica Nimba. Aegle Marmelos ... Vilva. Piperbetel Tāmbula. Butæa Gummi. Cæsalpina Sappan... Patanga or Bakam. Calotropis Procera and C. Gigantiæ Arka. Gossypium Herbaceum Kārpāsa. Cambogia Indica. Cissampelos Pariera Ambashthai.

Anogeissus Latifolia

Embelia Ribes and E. Robusta... Vidaiga.

Plantago Ovata ... Ispaghula.

•Ipomæa Hederacea ... Kālādāna.

Ipomæa Turpethum ... Trivit,

Coscinum Fenestratum

Gynocardia Odofata

Hygrophila Spinosa

Mylabris Phalerta.

Terminalia Chebula Haritakī.

Sesamum Indicum ... Tila.

Picrorhiza Kurroa ... Katuka.

Urginea Indica ... Vanapalāndu.

As regards the medicines used by the Hindus, Neuberger says<sup>1</sup>:

"The Pharmacopia, corresponding with the fruitful nature of the land was a rich one and stamps Indian medicine with a character entirely its own, whilst nothing speaks more eloquently for its originality than the fact that of all the many medicinal plants no single one was European."

Elphinstone wonders at the knowledge of simples in which the Hindus early gave lessons to Europe and "more recently taught us the benefit of smoking Datura in asthma and the use of cowitch against worms," and "the prescribing of Nux Vomica in paralysis and dyspepsia, and the revival of the use of Croton Tiglium" (Royle). In surgery, too, the modern surgeons of Europe have borrowed the Indian method of Rhinoplastic operation first made known to European surgeons by a letter which was printed in the Gentleman's Magazine for October 1794, p. 891. In fact Dr. Hirschberg of Berlin says that "the whole plastic surgery in Europe had taken its new flight when these cunning devices of Indian workmen became known to us. The transplanting of sensible skin flaps is also an entirely Indian method." The modern method of making pockets for the

<sup>1</sup> Neuberger, History of Medicine, vol. 1. P. 54,

testicles under the Colles' fascia after the operation for scrotal tumour (elephantiasis) can be traced back to the age of Susruta<sup>1</sup>.

Thus we see that it can safely be affirmed that the medical science of Europe has been, both directly and indirectly, influenced by the Hindu System of Medicine.

पादी निरससुष्तस्य जलीन प्रोत्य चाचिणी। प्रवेश्य तुन्यसेवन्या सुष्ती सीन्येत्ततः परं॥

Suśruta Samhitā, IV. ii.

THE END.

#### APPENDIX.

I'Tsing 1 says :-

"The following are the eight sections of medical science. The first treats of all kinds of sores; the second, of acupuncture for any disease above the neck; the third, of the diseases of the body; the fourth, of demoniac disease; the fifth, of the Agada medicine (i.e. antidote); the sixth, of the diseases of children; the seventh, of the means of lengthening one's life; the eighth. of the methods of invigorating the legs and body. 'Sores' (1) are of two kinds, inward and outward. The disease above the neck (2) is all that is on the head and face; any disease lower down from the throat is called a 'bodily' disease (3). 'Demoniac' (4) is the attack of evil spirits, and the 'Agada' (5, but 6 of Ayur-veda) is the medicine for counteracting By 'Children' (6, but 5 of Ayur-veda) is meant from the embrayo stage until after a boy's sixteenth year; 'lengthening life' (7) is to maintain the body so as to live long, while 'invigorating the legs and body' (8) means to keep the body and limbs strong and healthy. These eight arts formerly existed in eight books, but lately a man epitomized them and made them into one bundle. All physicians in the five parts of India practise according to this book, and any physician who is well versed in it never fails to live by the official pay. Therefore Indians greatly honour physicians and much esteem merchants, orf they do not injure life, and they give relief to others as well as benefit themselves. I made a successful study in medical

A Record of Buddhist Practices, Ch. XXVII, pp. 127-8.

science, but as it is not my proper vocation I have finally give it up."

Dr. Takakusu¹ comments on the passage as follows:—

"The eight sections of Medicine which I-tsing describes at no doubt the eight divisions of the Âyur-veda. He mentions a epitomiser of these divisions, who seems to have been a famou physician and contemporary of I-tsing (or just before I-tsing). This epitomiser may be Susruta, who calls himself a disciple of Dhanvantari, one of the Nine Gems in the Court of Vikramâditya

Prof. Wilson says in his Works, vol. iii, p. 274:-

• 'The Âyur-veda, which originally consisted of one hundred sections, of a thousand stanzas each, was adapted to the limited faculties and life of man, by its distribution into eight subdivisions, the enumeration of which conveys to us an accurate idea of the subject of the Ars Medendi amongst the Hindus.

The eight divisions are as follows:-

I. Sâlya (I-tsing's (1) cure of sores).

The art of extracting extraneous substances, grass, earth bone, &c., accidentally introduced into the human body, and by analogy, the cure of all phlegmonoid tumours and abscesses Salya means a dart or arrow.

II. Sålåkya (I-tsing's (2) art of acupuncture).

The treatment of external organic affections or diseases of the eyes, ears, nose, &c. It is derived from Salâkâ, "a thin and sharp instrument," and is borrowed from the generic name of the slender probes and needles used in operation on the parts affected.

A Record of Buddhist Practices, Ch. XXVII, pp. 222-3.

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The above two divisions constitute the surgery of modern schools.

III. Kâya-kikitsâ (I-tsing's (3) treatment of the diseases of the body).

The application of the Ars Medendi (Kikitså) to the body in General (Kâya). It forms what we mean by the science of medicine.

IV. Bhûta-vidyâ (I-tsing's (4) treatment of demoniac disease).

The restoration of the faculties from a disorganised state induced by demoniacal possession. The art vanished before the diffusion of knowledge, but it formed a very important branch of medical practice through all the schools, Greek, Arabic, or - European.

V. Kaumâra-bh*ri*tya (I-tsing's (6) treatment of the diseases of children).

The care of infancy, comprehending not only the management of children from their birth, but the treatment of irregular lactic secretion, and puerperal disorders in mothers and nurses.

VI. Agada (I-tsing's (5) Agada medicine).

The administration of antidotes—a subject which, as far as it rests upon scientific principles, is blended with our medicine and surgery.

VII. Råsåyana (I-tsing's (7) application of the means of lengthening one's life).

Chemistry, or more correctly alchemy as the chief end of the chemical combinations it describes, and which are mostly metallurgic, is the discovery of the universal medicine—the elixir that, was to render health permanent, and life perpetual.

VIII. Vågîkarana (I-tsing's (8) methods of invigorating the legs and body).

Promotion of the increase of the human race—an illusory research, which, as well as the preceding, is not without its parallel in ancient and modern times.'

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Prof. Wilson further remarks:—'We have, therefore, included in these branches all the real and fanciful pursuits of physicians of every time and place. Susruta, however, confines his own work to the classes Sâlya and Sâlâkya or surgery; although, by an arrangement not uncommon with our own writers, he introduces occasionally the treatment of general diseases and the management of women and children when discussing those topics to which they bear relation.' (See Wilson's Works, vol. iii, p. 276.)"

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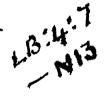
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